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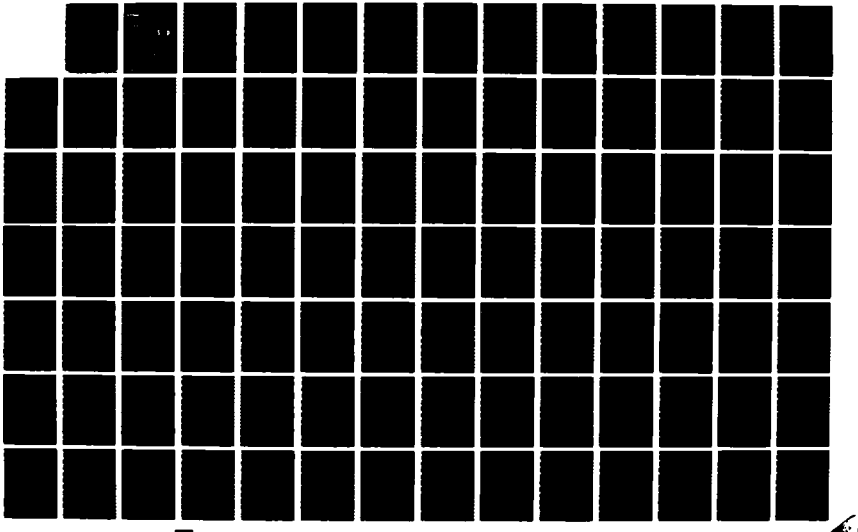

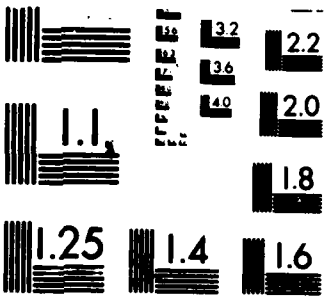

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TITAN SYSTEMS, INC.

ENHANCING THE POTENTIAL FOR POSTATTACK RECOVERY

Final Report

FOR:
Federal Emergency Management Agency
Washington, D.C. 20472

1 December 1986

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ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TASK VII

FINAL REPORT

1 DECEMBER 1986

PREPARED FOR: Federal Emergency Management Agency
Washington, D.C. 20472

PREPARED BY: Titan Systems, Inc.
1950 Gallows Road
Vienna, VA 22180

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TASK VII

FINAL REPORT

DETACHABLE SUMMARY

1 DECEMBER 1986

PREPARED FOR: Federal Emergency Management Agency
Washington, D.C. 20472

PREPARED BY: Titan Systems, Inc.
1950 Gallows Road
Vienna, VA 22180

DETACHABLE SUMMARY

This document contains a series of six papers addressing different actions which, after implementation, could enhance the potential for post-attack recovery. It was produced as part of an overall project which the FEMA-National Preparedness Directorate tasked to Titan Systems, Inc., in order to support the development of practicable plans and procedures for actions the federal government may take to enhance the probability of national survival and provide an improved basis for long-term recovery should the United States suffer a nuclear attack. The project encompassed a series of analytical steps to support recommendations for expedient and realistic actions that the federal government could undertake now or during a national crisis to correct identified shortfalls in the projected national postattack emergency response capabilities.

These analytical steps constituted separate tasks to:

- Characterize the nation's most serious postattack problems;
- Identify required resources, and capabilities needed to apply resources, in order to alleviate the problems;
- Determine the mechanisms (to include industry and other private sector participation) needed to effect required resource management; and
- Identify shortfalls currently existing in preparedness programs to provide such mechanisms.

These analyses resulted in the Titan report, "Enhancing the Potential for Postattack Recovery: Recommended Decisions and Actions," from which FEMA selected the six actions to be addressed in further detail.

Four of the papers present technical information to be used in developing Major Emergency Action (MEA) papers which will provide senior federal government decision makers with information to make decisions on specified courses of action during a national crisis. In addition, two papers present peacetime actions intended to help overcome shortfalls in current nuclear attack preparedness planning. The papers are described below.

Crisis Dispersal of Pharmaceuticals

Five alternatives are presented to decision makers on levels of government involvement in the implementation of dispersal of pharmaceuticals from high risk areas to lower risk areas during a national crisis.

Only prescription drugs which were determined to be critical postattack were considered for crisis dispersal. These drugs included several from each of the following categories:

- Antibiotics
- Analgesics
- Vaccines
- Potassium iodide
- Large volume parenterals
- Plasma derivatives

Regardless of the level of implementation, the intention of this action is to persuade industry to disperse drugs from their manufacturing facilities to safer locations without relinquishing ownership of the drugs. Interviews with industry representatives revealed that, while most industries

would comply with a government dispersal request during a national crisis, peacetime negotiation of standby agreements and peacetime planning of such an action would improve the chances that dispersal of pharmaceuticals could be implemented efficiently during a national crisis.

Crisis Implementation of EMP Mitigation Procedures at Broadcast Stations

In the event that a national crisis were to occur before broadcast stations have been EMP hardened, options are presented to decision makers on how broadcast stations could quickly improve the survivability of some equipment against the effects of electromagnetic pulse (EMP).

Five alternatives are presented on levels of government involvement. Options are based on the assumption that broadcast stations may have as little as 2-4 hours to implement EMP mitigation procedures and a maximum of 1-2 weeks. Equipment to be considered during this time would be minimal and all of it at the transmitter site. Within 2-4 hours, only procedural EMP mitigation could be implemented. However, within 1-2 weeks, it would be possible to install protective devices and, thus, EMP harden some equipment.

The intent of this action is to persuade industry to perform EMP mitigation procedures on their own equipment with a minimum of government assistance. Interviews with industry representatives revealed that, while industry would probably be willing to implement EMP mitigation procedures during a national crisis, they would need guidelines and, perhaps, training in advance to assure that they would be capable of performing the work themselves.

Crisis Dispersal of Petroleum Products

Five alternatives are presented to decision makers on levels of government and industry involvement in the implementation of crisis dispersal of petroleum products from primary storage facilities located in high risk areas to secondary and tertiary storage located in lower risk areas. In addition, a sixth alternative is presented regarding involvement of the general public in storage of petroleum products.

Only specific bulk petroleum products determined to be critical postattack are considered for crisis dispersal. These include:

- Some distillate fuel oils
- Residual fuel oil
- Jet fuel
- Gasoline

The intent of this action is to move as large a quantity of petroleum products from high risk storage areas to lower risk storage areas with as little government involvement as possible. Interviews with industry representatives revealed that the petroleum industry is opposed to crisis dispersal of petroleum products for several reasons, primarily due to the configuration of the distribution system and industry storage capacity. The general opinion is that increased public demand is the key to efficient and effective dispersal.

Crisis Dispersal of Transportation Assets

Five alternatives are presented to decision makers on levels of government involvement in the implementation of crisis relocation of commercial transportation assets from high risk areas to lower risk areas. These assets include:

- Railroad freight
- Motor freight
- Surface passenger
- Commercial air
- Commercial shipping

Interviews with industry representatives revealed that some sectors of the transportation industry have addressed this idea and are currently formulating plans. The trucking industry is the exception since there is a belief that trucks are adequately dispersed.

Peacetime EMP Mitigation of Petroleum Facilities

With the increasing dependency of petroleum drilling, refining, and pumping facilities on computer controls, the intent of this action is to decrease the vulnerability of the petroleum industry to the effects of electromagnetic pulse (EMP). Four alternatives are presented on levels of industry implementation from procedural EMP mitigation to full physical hardening of all petroleum facilities.

The problems faced when addressing this action are enormous since: (1) the degree of industry-wide vulnerability to EMP effects has not been quantified; (2) the techniques for EMP hardening petroleum facilities specifically have not been developed; and (3) the costs are anticipated to be high. The government would need to develop industry-specific EMP mitigation or hardening techniques, develop guidelines, and provide training to industry technicians in order to ensure an effective EMP mitigation program.

Industry interviews revealed a lack of awareness of the industry-specific dangers of EMP. Due to the severe financial difficulties which the petroleum industry is facing, the general opinion was that peacetime EMP mitigation would be a low priority.

Industry Involvement in Research and Publication of Survival Information

This paper presents a national program to enlist industry and industrial associations to cooperate in funding and performing research and publication of survival information. The program is designed to solicit industry support using corporate motivational psychology, as well as by creating a public relations campaign which would benefit companies who participate. The levels of expected industry cooperation are defined as: (1) voluntary, (2) with incentives, and (3) as mandated.

During the course of researching the other five papers in this report, industry representatives were questioned as to the possibility that corporations might participate in such a program. While no one was willing to commit their company immediately, there was a general indication that, if approached correctly, many corporations and associations would be willing to participate.

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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EMP Hardening	Survival Information

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This document contains a series of six papers addressing different actions which, after implementation, could enhance the potential for postattack recovery. It was produced as part of an overall project which FEMA-NP Directorate tasked to Titan Systems, Inc., in order to support the development of practicable plans and procedures for actions the federal government →

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A

may take to enhance the probability of national survival and provide an improved basis for long-term recovery should the United States suffer a nuclear attack. The project encompassed a series of analytical steps which constituted separate tasks to: (1) Characterize the nation's most serious postattack problems; (2) Identify required resources, and capabilities needed to apply resources, in order to alleviate the problems; (3) Determine the mechanisms (to include industry and other private sector participation) needed to effect required resource management; and (4) Identify shortfalls currently existing in preparedness programs to provide such mechanisms. These analyses resulted in the Titan report, "Enhancing the Potential for Postattack Recovery: Recommended Decisions and Actions," from which FEMA selected the six actions to be addressed in further detail. Research was performed through interviews with industry and government agencies as well as analysis of published material. Four of the papers present technical information to be used in developing Major Emergency Action (MEA) papers which will provide senior federal government decision makers with information to make decisions on specified courses of action during a national crisis. In addition, two papers present peacetime actions intended to help overcome shortfalls in current nuclear attack preparedness planning. The subjects of the paper are: Crisis Dispersal of Pharmaceuticals; Crisis Implementation of EMP Mitigation Procedures at Broadcast Stations; Crisis Dispersal of Petroleum Products; Crisis Dispersal of Transportation Assets; Peacetime EMP Mitigation of Petroleum Facilities; and Industry Involvement in Research and Publication of Survival Information.

Express: Radio nature

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EXECUTIVE SUMMARY

This document contains a series of six papers addressing different actions which, after implementation, could enhance the potential for postattack recovery. It is produced as part of an overall project to identify and recommend plans and procedures to enhance the potential to sustain survivors of a nuclear attack, as well as to provide an improved basis for long-term national recovery.

The National Preparedness Programs Directorate of the Federal Emergency Management Agency selected the six areas from numerous crisis and peacetime actions recommended in TITAN's report, "Enhancing the Potential for Postattack Recovery: Recommended Decisions and Actions," dated 23 September 1986. Research for the technical data relied heavily on interviews with industry representatives, as well as analysis of published material.

Four of the papers present technical information to be used in developing Major Emergency Action (MEA) papers which will provide senior federal government decision makers with information to make decisions on specified courses of action during a national crisis. In addition, two papers present peacetime actions intended to help overcome shortfalls in current nuclear attack preparedness planning.

A

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TECHNICAL DATA FOR MEA PAPER:

CRISIS DISPERSAL OF PHARMACEUTICALS

DECEMBER 1986

TITAN SYSTEMS, INC.
1950 GALLOWS ROAD
VIENNA, VA 22180

TABLE OF CONTENTS

CRISIS DISPERSAL OF PHARMACEUTICALS (CDP)

I. PURPOSE OF ACTION

To enhance the availability of critical drugs during a national emergency through coordination of industry and government in the dispersal of these resources from high risk areas to lower risk areas.

II. ALTERNATIVE LEVELS OF IMPLEMENTATION

Five levels of implementation are described in this section. Each represents a separate option to implement crisis dispersal of pharmaceutical products to lower risk areas. The five levels are:

Option A: Government requests voluntary cooperation from industry to disperse drugs.

Option B: Government offers limited financial or logistical assistance to industry to disperse drugs.

Option C: Government activates standby voluntary agreements between government and industry.

Option D: Government activates standby agreements with industry which include limited financial or logistical assistance.

Option E: Government orders industry to disperse drugs.

A selected option would be implemented only in the event of an international crisis. All of the options require some preparatory activities. The five options are listed in order of increasing government involvement in their implementation.

A. Government requests voluntary cooperation from industry to disperse drugs

- No cost to government
- Industry bears cost
- No prior government coordination or agreements with industry

- May require declaration of national emergency to help motivate industry compliance

- Government modifies or suspends federal regulations that may restrict industry action, such as:

  - 21 CFR regulations on: shelf life restrictions of specific drugs and DEA restrictions on stock levels of analgesics

- Government identifies to industry which critical drugs to disperse

- Government provides to industry dispersal plan timetable

- Industry fully responsible for providing:

  - Finished critical drug products
  - Transportation means
  - Lower risk storage areas
  - Security
  - Inventory monitoring and reporting
  - Personnel

- Drugs remain under control and ownership of industry

B. Government offers limited financial or logistical assistance to industry to disperse drugs

- No prior government coordination or agreements with industry

- May require declaration of national emergency to help motivate industry compliance and to obtain congressional approval to fund industry reimbursement

- Government modifies or suspends federal regulations that may restrict industry action, such as:

  - 21 CFR on: shelf life restrictions of specific drugs and DEA restrictions on stock levels of analgesics

- Government identifies to industry which critical drugs to disperse

- Government provides industry dispersal plan timetable

- Industry fully responsible for providing finished critical drug products and inventory monitoring and reporting

- Government assumes one or more of the following costs on an ad hoc basis:

- Transportation means
- Lower risk storage areas
- Security
- Personnel
- Reimbursement for dispersed drugs actually used
- Reimbursement for drugs lost due to spoilage or expiration of shelf life

• Drugs remain under control and ownership of industry

C. Government activates standby voluntary agreements between government and industry

• During peacetime, government negotiates voluntary agreements with industry. Section VII, Supporting Material, lists items to be negotiated in agreements

• Government notifies industry to "activate plan CDP"

• No cost to government after negotiations of standby agreements

• Industry bears cost

• Implementation details determined in advance on a company by company basis with industry association involvement

• Will not require declaration of national emergency since industry cooperation has been previously agreed to

• Government modifies or suspends appropriate federal regulations that may restrict industry action, such as:

  - 21 CFR on: shelf life restrictions of specific drugs and DEA restrictions on stock level of analgesics

• Drugs remain under control and ownership of industry

D. Government activates standby agreements with industry which include limited financial or logistical assistance

• During peacetime, government negotiates agreements with industry. Section VII, Supporting Material, lists items to be negotiated in agreements

• Government notifies industry to "activate plan CDP"

• Implementation details determined in advance on a company by company basis with industry association involvement

- Will not require declaration of national emergency to obtain industry cooperation, but may require such a declaration if congressional funding is to be provided for industry reimbursement

- Government modifies or suspends appropriate federal regulations that may restrict industry action, such as:

  - 21 CFR on: shelf life restrictions of specific drugs and DEA restrictions on stock level of analgesics

- Government identifies to industry which critical drugs to disperse

- Government provides industry dispersal plan timetable

- Industry fully responsible for providing finished critical drug products and inventory monitoring and reporting

- Government assumes one or more of the following costs:

  - Transportation means
  - Lower risk storage areas
  - Security
  - Personnel
  - Reimbursement for dispersed drugs actually used
  - Reimbursement for drugs lost due to spoilage or expiration of shelf life

- Drugs remain under control and ownership of industry

E. Government orders industry to disperse drugs

- Government activates Section 101.b of the Defense Production Act to enforce dispersal orders

- Government modifies or suspends federal regulations that may restrict industry actions, such as:

  - 21 CFR on: shelf life restrictions of specific drugs and DEA restrictions on stock level of analgesics

- Government provides industry with as complete a set of precise instructions as possible

- This option designed to be used only if industry refuses to cooperate with voluntary measures or standby agreements

III. AUTHORITIES

A. Defense Production Act

- Section 101(a) (50 U.S.C. app. 2061) - requires the priority performance of contracts and orders in support of approved programs and permits the allocation of resources and facilities to promote the national defense.

- Section 101(b) (50 U.S.C. 2071(b)) - authorizes the government to control the distribution of resources in the civilian market when a material is "scarce, critical, and essential to national defense."

- Title III, as amended 1984 (50 U.S.C. app. 2091, et seq) - authorizes government to provide financial incentives to expedite productive capacity and supply.

B. Defense Priorities and Allocations System (DPAS) regulation (15 CFR 350) - provides a framework within the Department of Commerce for rapid industrial mobilization in a national emergency.

C. EO 11490 - Assignment of Emergency Preparedness Functions to Federal Departments and Agencies.

- Part 4 assigns Department of Commerce responsibilities to prepare emergency plans for the distribution of manufactured goods.

- Part 8 assigns Department of Health and Human Services responsibilities to prepare emergency plans for mobilization of health resources and the distribution of drugs and biological products.

- Part 11 assigns Department of Justice responsibilities for the administration of laws governing the distribution of narcotics during an emergency.

- Part 22 assigns Federal Emergency Management Agency responsibilities for coordination of all emergency preparedness activities of the federal government.

D. EO 10480 - Administration of Defense Mobilization Program

- Sections 101, 102 - delegate the relevant functions to FEMA and redelegate functions to DOC with respect to industry.

- Part III - defines agency responsibilities in providing private sector financial incentives.

- Section 201 - delegates responsibilities to agencies for priorities and allocations.

- Section 501 - grants authority to USDA, DOC, DOI, DOT, DOE, and DOD to enter into agreements with industry. Delegates President's authority to consult with industry to FEMA and delegates authority to OMB to develop guidelines and procedures for the establishment of advisory committees to assist with agreements.

E. 21 CFR Series

- No. 210 - Current good manufacturing practices (GMP) in manufacturing, processing, packaging, or holding drugs.

- No. 211 - Current good manufacturing practices for finished pharmaceuticals.

- No. 300-499 - Drugs for Human Use. States the FDA's policy in administering new drugs, antibiotics, and other regulatory provisions of the Federal Food, Drug, and Comestic Act, which includes antibiotic drugs, general packaging and labeling antibiotic drugs, and exemptions from antibiotic certification and labeling requirements.

- No. 600-680 - States provisions and standards for human blood, blood products, and vaccines including registration, practice, and storage.

- No. 1300-end - Drug Enforcement Administration and Department of Justice procedures for governing manufacturing and other aspects of the pharmaceutical industry in so far as distributing, quotas, importation, exportation as well as all their administrative functions, practices, and procedures.

F. 44 CFR Series

- No. 323 - Defense Mobilization Order 4 - provides guidance on priority use of resources in the immediate postattack period.

- No. 332.2 - Provides interagency policy guidelines for development, approval, and implementation of voluntary agreements.

G. FPC-7 - provides general guidance for resource management in national emergencies.

IV. EXPECTED BENEFITS

General - Benefits of dispersing drugs

- Improves survivability of assets by moving from high risk areas where currently located (see figure 1) to lower risk areas
- Provides easy access because supplies will be near survivors
- Mitigates effects of attack by enhancing application of drugs to ill and injured
- Enhances possibility of human survival by limiting a second wave of deaths due to disease
  - Unvaccinated children
  - Infections from injuries
- Provides for supplies of drugs until pharmaceutical industry can be rebuilt

A. Benefits of Option A - Government requests voluntary industry cooperation

- Simple approach
  - No peacetime administration
  - Industry responsible for administration of action

B. Benefits of Option B - Government offers limited financial or logistical assistance to industry

- No peacetime administration
- Industry may be more cooperative if government provides assistance
- Government assistance may make for more organized and consistent action

C. Benefits of Option C - Government activates standby voluntary agreements with industry

Figure 1 - LOCATION OF DRUG MANUFACTURERS

- Ensures highly coordinated action
- Ensures that proper facilities can be prepared in advance
- Industry responsible for administration of action
- Provides good public relations potential for industry

D. Benefits of Option D - Government activates standby agreements with industry which include limited financial or logistical assistance

- Ensures highly coordinated action
- Ensures that proper facilities can be prepared in advance
- Industry may be more cooperative if government provides assistance and/or incentives
- Government may have more control of inventories and their use

E. Benefits of Option E - Government orders industry to disperse drugs

- Makes action possible if industry is unwilling to cooperate voluntarily

V. EXPECTED COST

General - Negative impact of pharmaceutical dispersal during crisis

- Diverting drug shipments may cause orders to be unfilled
  - Based on data in critical drug matrix (Section VII. B), cost to industry for drug products at approximate wholesale value could be high
  - Shortage of drugs in higher risk areas
- Without tight security drugs in transit would be vulnerable to theft
- The national movement of drugs away from population centers might heighten public alarm
- International tensions could be increased by perceived implications of this action

General - Repercussions if the crisis is resolved peacefully

- Companies will have been unable to meet obligations to customers
- Transportation costs of returning drugs to appropriate peacetime consumer locations
- Possibility of a shortage of drugs in high population area while holding areas being emptied
- If production is necessary to overcome high population area shortfalls pending redistribution of drugs, there could be a resultant glut in market of certain drugs

A. Expected Cost of Option A - Government requests voluntary industry cooperation

- Without advance planning may not have
  - Adequate refrigerated transportation and storage facilities
  - Adequate availability of packaging and paraphernalia
  - Adequate coordination between government and industry
- Cost elements of action for each pharmaceutical company
  - Transportation
  - Personnel
  - Value of products
  - Administration
  - Storage

B. Expected Cost of Option B - Government offers limited financial or logistical assistance to industry

- Without advance planning may not have
  - Adequate refrigerated transportation and storage facialities
  - Adequate availability of packaging and paraphernalia
  - Adequate coordination
    - -- Between government and industry
    - -- Among government agencies
- Government assistance would divert federal assets from other uses
  - Transportation assets limited
  - Funds would need to be budgeted or shifted from another program budget

- Cost elements of action are the same as for Option A with the government assuming an undetermined proportion of the cost

C. Expected Cost of Option C - Government activates standby agreements with industry

- In addition to the cost elements listed in Option A, there will be administrative costs during peacetime for negotiation of standby agreements

D. Expected Cost of Option D - Government activates standby agreements with industry which include limited financial or logistical assistance

- Government assistance would divert assets from other uses
  - Transportation assets limited
  - Funds would need to be budgeted or taken from another program budget
- Cost elements are the same as for Option C with the government assuming an undetermined proportion of the crisis dispersal costs

E. Expected Cost of Option E - Government orders industry to disperse drugs

- Without advance planning may not have
  - Adequate refrigerated transportation and storage facilities
  - Adequate availability of packaging and paraphernalia
  - Adequate coordination between government and industry
- Cost elements of action are the same as for Option A
- Government/industry relations would be impaired should crisis be resolved peacefully

VI. IMPLEMENTATION PROCESS

For the five options, the crisis period implementation process is:

A. Option A: Government requests voluntary cooperation from industry to disperse drugs

- Department of Health and Human Services (DHHS), in coordination with the Department of Commerce (DOC), Drug Enforcement Administration (DEA), and FEMA, contacts companies manufacturing and distributing critical pharmaceuticals
  - Requests them to disperse these drugs to lower risk areas
  - Identifies the types of drugs to be dispersed
  - Provides a timetable for dispersal
- FEMA requests FDA and DEA cooperation on 21 CFR series regulations on shelf life of certain drugs, stock levels of analgesics, and any other regulations which may restrict industry compliance with the crisis dispersal request; FDA notifies industry of changes
- Companies move identified drugs to lower risk locations and report progress to DHHS
- FEMA monitors progress of drug dispersal

B. Option B: Government offers limited financial or logistical assistance to industry to disperse drugs

- DHHS, in coordination with DOC, FEMA, and DEA, contacts companies manufacturing and distributing critical pharmaceuticals
  - Requests them to disperse drugs to lower risk areas
  - Offers limited financial assistance to companies, as necessary, to secure their cooperation
  - Identifies the types of drugs to be dispersed
  - Provides a timetable for dispersal
- FEMA requests FDA and DEA cooperation on 21 CFR series regulations on shelf life of certain drugs, stock levels of analgesics, and any other regulations which may restrict industry compliance with the crisis dispersal request; FDA notifies industry of changes

- DHHS sends request for supplemental funds to the Office of Management and Budget (OMB)
- Companies move identified drugs to lower risk locations and report progress to DHHS
- FEMA monitors progress of drug dispersal
- Companies submit requests for reimbursement to DHHS
- DHHS reimburses companies for their actions, as agreed when the request was made

C. Option C: Government activates standby voluntary agreements with industry

- DHHS informs pharmaceutical and drug wholesale companies who have standby government agreements to "Activate Plan CDP"
- FEMA requests FDA and DEA cooperation on 21 CFR series regulations on shelf life of certain drugs, stock levels of analgesics, and any other regulations which may restrict industry compliance with the crisis dispersal request; FDA notifies industry of changes
- Companies move identified drugs to lower risk locations and report progress to DHHS
- FEMA monitors progress of drug dispersal

D. Option D: Government activates standby agreements with industry which include limited financial or logistical assistance

- DHHS informs pharmaceutical and drug wholesale companies with standby government agreements to "Activate Plan CDP"
- FEMA requests FDA and DEA cooperation on 21 CFR series regulations on shelf life of certain drugs, stock levels of analgesics, and any other regulations which may restrict industry compliance with the crisis dispersal request; FDA notifies industry of changes
- DHHS notifies OMB of intention to draw on emergency funds
- Companies move identified drugs to lower risk locations and report progress to DHHS
- FEMA monitors progress of drug dispersal
- Drug companies submit requests for reimbursement to DHHS

- DHHS reimburses companies for their actions, in accordance with financial assistance agreements

E. Option E: Government orders industry to disperse drugs

- The President activates Section 101.b of the Defense Production Act for pharmaceuticals
- DHHS contacts companies manufacturing and distributing critical pharmaceuticals
  - Directs them to disperse identified drugs to lower risk areas and to report their progress to DHHS
  - Identifies the types of drugs to be dispersed
  - Provides a timetable for dispersal
- FEMA requests FDA and DEA cooperation on 21 CFR series regulations on shelf life of certain drugs, stock levels of analgesics, and any other regulations which may restrict industry compliance with the crisis dispersal request; FDA notifies industry of changes
- Companies disperse identified drugs to lower risk locations and notify DHHS of their progress
- FEMA monitors progress of industry in dispersing drugs

VII. SUPPORTING MATERIAL

A. Reasons for Crisis Dispersal

- Pharmaceutical manufacturers primarily located in high risk areas (see Figure 1); industry cannot be quickly rebuilt
- Wholesalers located near high population areas
- Retailers (pharmacies and hospitals) are the most dispersed but do not carry large stocks
  - Antibiotics - some
  - Analgesics - less
  - Vaccines - hardly any
  - Parenterals - hardly any
  - Potassium Iodide - hardly any
- Advantage of crisis dispersal vs. peacetime dispersal
  - Less expensive
  - Companies may be more cooperative during a crisis

- Disadvantages of crisis dispersal
  - Logistics
    - -- Signaling industry to begin
    - -- Who sends what, where
    - -- Need for Security
    - -- Storage
      - •• Competition for existing facilities
      - •• Controlled temperature
  - Ownership when crisis passes
  - Transportation
    - -- Traffic problems
    - -- Refrigeration problems
    - -- Competition for rolling stock
  - Some stocks may be low (analgesics, vaccines, and parenterals)

B. Critical Drug Matrices

This section contains two matrices:

- Postattack critical drugs, and
- Manufacturers of critical drugs

The drugs listed in these matrices were identified through research as being those prescription drugs which would be most critical for providing medical attention to survivors of a nuclear attack.

The categories in the first matrix, postattack critical drugs, include the following:

- Critical drug: the actual drug expected to be critical in sustaining survivors in a postattack environment.
- Manufacturers: A major manufacturer of each drug listed (expanded list in following matrix).
- Dosage/Rate: The adult dosage level per drug and frequency (e.g., 250 mg/4 times daily/10 days).
- Shelf Life: Time period the drug remains safe and effective from production to expiration date if stored according to FDA regulations.
- Cost: Approximate wholesale cost.
- Retail: The price the consumer generally pays.

POSTATTACK CRITICAL DRUGS

CRITICAL DRUG	MANUFACTURERS	DOSAGE/RATE	SHELF LIFE*	COST** $/10^3	RETAIL $/10^3	SOURCE/SUPPLIER
Antibiotics						
• Penicillins	Lilly - Indianapolis, IN	125-250 mg/4x daily	6-7 yrs.	115	150	V-Cillin K, tablets - oral solutions
• Cephalosporins	Lilly - Indianapolis, IN	250 mg/6 hrs.	6-7 yrs.	770	1000	Keflex, tablets, oral suspension
• Tetracyclines	Parke Davis - Morris Plains, NJ	500 mg/1 to 2g daily	3-4 yrs.	115	150	Cyclopar 500, capsules
• Sulpha Drugs	Roche - Nutley, NJ	1mg/2x daily	3-4 yrs.	200	260	Accutaine, capsules, bactrin, septra tablets, infusion
Analgesics						
• Morphine	Roxane - Columbus, OH	10-20 mg/	4-5 yrs.	530	689	Morphine Sulfate, oral solution & tablets
• Demerol	Winthrop - New York, NY	50-150 mg/3-4 hrs.	4-5 yrs.	240	310	Carpuject 2.5% solution, boxes of 10, vials of 30ml, tablets, syrup
• Pantopon	Roche - Nutley, NJ	20 mg/4-5 hrs.	4-5 yrs.			Hydrochlorides of opium alkaloids, ampules 1ml, injectable
• Dilaudid	Knoll - Whippany, NJ	2 mg/4-6 hrs.	4-5 yrs.	284	370	Hydromorphone hydrochloride (ampules 1-4mg), vials, tablets (suppositories)
• Codeine	Carnrick - Cedar Knolls, NJ	15 ml/4 hrs.	4-5 yrs.	240	310	Flavored suspension, tablets
Vaccines						
• Polio	Lederle - Wayne, NJ	1.0 ml	2 yrs.			Monkey kidney tissue, 0.5ml dispettes, 10 dose vial w/dropper
• Measles	Merck Sharp & Dohme - West PH, PA	0.5 ml	2 yrs.			Chicken embryo, intra muscular
• Hepatitis	Merck Sharp & Dohme - West PH, PA	3-5 ml	1 yrs.			Human immunoglobin (10-18% protein) intra muscular
• Typhoid	Wyeth - Philadelphia, PA	0.5 ml	2 1/2 yrs.			Salmonella typhi bacteria, 8 units/ml, vials 5, 10, 20ml, injection
• Tetanus Toxoid	Wyeth - Philadelphia, PA	0.5 ml	2 yrs.			Vials of 5ml, injectable
• BCG (TB)	Glaxo - RT Park, NC	0.1 ml	1 1/2 yrs			Bacillus of calmette & guerin
Potassium Iodide	Forest Pharm. - St. Louis, MO	135 mg/3x daily				Potassium iodide, A06 tablets
Large Volume Parenterals						
• Sodium Chloride	Lederle - Wayne, NJ	.9% 3 ml 5ml				Vials, powders, liquid
• Dextrose	Bristol - Syracuse, NY	20 mg/oz.				Contrex, tablet, capsules
Plasma/Derivatives			6 yrs.			
• Globulin Expander	Cutter Biological - Berkley, CA	15 ml				Intramuscular, vials, injectable

*NOTE: Shelf life is very dependent on specific temperature environments.
**NOTE: The cost column was derived by assuming the retail price is a 30% markup.

- Source/Supplied: Additional information of the specific drug, such as primary raw material, packaging (i.e., tablets, capsules, etc.), and product name.

The second matrix, critical drug manufacturers, is an expanded list of the manufacturers who produce and/or market the specific drugs, showing where these manufacturers are located.

C. Industry Views on Feasibility of Crisis Dispersal

- Some believe that there currently may be adequate dispersal of antibiotics and analgesics
  - Approximately 320 wholesaler warehouses nationwide
    -- Located in or near large cities
    -- Hold stocks of approximately two weeks normal demand
  - Manufacturers have distribution centers
    -- One to three months supplies
    -- Approximately 13 centers
  - Approximately two weeks supplies in transit from manufacturer to wholesaler
- Most believe that there is inadequate supply of vaccines, parenterals, and potassium iodide
  - Not well dispersed
  - Wholesalers not involved in distribution
  - Neither retail nor manufacturers hold large stocks
- In a national emergency, industry would cooperate with any national plan
- Planning is important
  - To avoid chaos
  - To ensure adequate facilities are available
  - To ensure adequate transportation is available
  - To resolve ownership/compensation/liability issues
  - To control analgesics adequately
- Transportation problems
  - Most drugs should be refrigerated to maintain shelf life
  - Security essential
- Analgesics are tightly controlled
  - Kept in timed locks which may be difficult to bypass
  - While expediency will be essential, controls will be important to ensure that drugs don't end up in the wrong hands

MANUFACTURERS OF CRITICAL DRUGS

ANTIBIOTICS	ANALGESICS	VACCINES	PARENTERAL SOLUTIONS
enicillins 1) Bristol - Syracuse, NY 2) Biocraft - Elmwood Park, NJ 3) Parke-Davis - Morris Plains, NJ 4) Schein - Port Washington, NJ 5) Smith Kline & French - Philadelphia, PA 6) Lilly - Indianapolis, IN 7) Squibb - Princeton, NJ **ephalosporins** 1) Lilly - Indianapolis, IN 2) Dista - Indianapolis, IN **etracyclines** 1) Lederle - Wayne, NJ 2) Squibb - Princeton, NJ 3) Smith Kline & French - Philadelphia, PA 4) Parke-Davis - Morris Plains, NJ 5) Danbury - Danbury, CT 6) Schein - Port Washington, NY 7) Zenith - Northvale, NJ **ulfa Drugs** 1) Burroughs Wellcome - Rt Park, NC 2) Roche, Nutley, NJ	**Morphine** 1) Lederle - Wayne, NY **Demerol** 1) Winthrop-Breon - New York, NY **Pantopon** 1) Roche - Nutley, NJ **Dilaudid** 1) Knoll - Whippany, NJ **Codeine** 1) Burroughs Wellcome - Rt Park, NC 2) Rorer - Fort Washington, PA 3) Carnick - Cedal Knolls, NJ 4) Wyeth - Philadelphia, PA 5) McNeil Pharm. - Spring House, PA	**Polio** 1) Lederle - Wayne, NJ **Measles** 1) Merck Sharp & Dohme-West Pt, PA **Typhoid** 1) Wyeth - Philadelphia, PA **Tetanus Toxoid** 1) Sclavo - Wayne, NJ 2) Wyeth - Philadelphia, PA 3) Squibb - Princeton, NJ **BCG** 1) Glaxo - Research Triangle Park, NC	**Sodium Chloride** 1) Wyeth - Philadelphia, PA 2) Roxane - Columbus, OH 3) Elkins-Sinn - Cherry Hill, NJ 4) Baxter Travenol - Chicago, IL **Dextrose Solutions** 1) Bristol - Syracuse, NY 2) Elkins-Sinn - Cherry Hill, NJ 3) Baxter Travenol - Chicago, IL **Plasma Derivatives/Globulin** 1) Cutter Biological - Berkley, CA 2) Hyland Therapeutics - Glendale, CA 3) Savage - Melville, NY **Plasma Expanders** 1) Alpha Therapeutic - Los Angeles, CA
			POTASSIUM IODIDE 1) Forest Pharm. - St. Louis, MO 2) Poythress - Richmond, VA 3) Knoll - Whippany, NJ 4) Upsher-Smith - Minneapolis, MN

- There are DEA quotas on amounts produced and stocked in a single location

- FDA regulations generally not seen as a hindrance to distribution
  - FDA will need to work with industry to expedite process
- Some believe transportation of drugs during a crisis will increase the anticipated traffic congestion problems

D. Industry Views on Alternative Actions

- Option A: Government requests voluntary industry cooperation
  - Industry would probably respond to a request in a major national emergency if government could provide industry with procedural information at the time
- Option B: Government offers limited financial or logistical assistance to industry
  - Industry would probably respond to a request in a major national emergency if government could provide industry with procedural information at the time
  - Preferred by industry over Option A because government could provide transportation and storage
- Option C: Government activates standby voluntary agreements with industry
  - Standby agreements are preferred to avoid confusion during crisis and ensure availability of transportation and storage
  - Wholesalers could be the central contacts for dispersal of the drugs they represent
    -- Have largest inventories
    -- Have contact with manufacturers and retailers for easy access to additional supplies
  - To increase supplies to be dispersed, selected drugs could have shelf lives extended so that expired but useable drugs would not be destroyed
- Option D: Government activates standby agreements with industry which included limited financial or logistical assistance
  - Standby agreements are preferred to avoid confusion during crisis and ensure availability of transportation and storage
  - Wholesalers could be the central contacts for dispersal of the drugs they represent

-- Have largest inventories
-- Have contact with manufacturers and retailers for easy access to additional supplies

- To increase supplies to be dispersed, selected drugs could have shelf lives extended so that expired but useable drugs would not be destroyed
- Incentives for participation:
  -- Government provision of transportation and storage
  -- Government compensation should crisis pass
- This is probably the preferred industry option because of combination of prior planning and government assistance

- Option E: Government orders industry to disperse drugs

  - Not considered necessary

E. Candidate items to be negotiated for inclusion in Government-Industry Standby Agreements (Options C and D)

- Identification of drugs to be dispersed

- Quantities of drugs to be sent to each holding area

- Selection of holding areas

  - Criteria
    -- Storage capacity
    -- Temperature controls
    -- Location in relation to population centers
    -- Vulnerability to attack
    -- Survivability
    -- Security
  - Locations
    -- Hospitals
    -- Packaging plants
    -- Wholesalers warehouses
    -- Other private facilities (example: bank vaults)

- Methods of dispersal

  - Types of vehicle
    -- Trucks
    -- Armored cars
    -- Railway
    -- Aircraft
    -- Vehicle markings
    -- Personnel

- Extent to which FDA regulations can be modified to expedite dispersal

- Labeling of dispersed drugs
  - Use present labels or add critical drug label
- Timetable for drug dispersal
  - Immediate dispersal or phased timetable for dispersal
- Disposition of drugs should crisis pass
  - Labeling
  - Return of drugs to commercial pipeline
  - Shelf life considerations
- Industry responsibilities during transattack and postattack
- Additional items to be negotiated only for Option D (limited financial or logistical assistance)
  - Government role in providing
    - -- Low risk storage areas
    - -- Transportation means
    - -- Personnel
    - -- Reimbursement for dispersal drugs actually used
    - -- Reimbursement for drugs lost due to spoilage or expiration of shelf life
    - -- Security
    - -- Tax incentives

F. Government preparatory activities which need to take place during peacetime

- Determine if critical drug list is complete (see Section VII. B, above)
- Determine which companies would be contacted to participate in crisis drug dispersal
  - Manufacturers (see Section VII. B, above)
  - Wholesalers
  - Associations
    - -- National Wholesalers Drug Association
    - -- Pharmaceutical Manufacturers Association
    - -- American Hospital Association
- If Options B or D (limited financial or logistical assistance) are being considered

- Prepare a budget for funds which would be drawn on only in an emergency
- Submit to OMB for inclusion in federal budget

- If Options C or D (standby agreements) are being considered

  - Identify government negotiation team
    - FEMA
    - NSC
    - FDA
    - DEA
    - DOT
    - DOD
    - DOC
    - VA

  - Contact selected industry participants and begin negotiations on a company by company basis or with designated associations

G. References

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- Code of Federal Regulations

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- Whelan, Patricia. Medical Device Register 1982. Directory Systems, Inc. Greenwich, CT, 06830. 1982.

H. Companies, Agencies, and Individuals Contacted

COMPANIES/AGENCIES	INDIVIDUALS
Alderson Pharmacy	Jim Coleman
American Society of Hospital Pharmacists	Charles Myers
American Pharmaceutical Association	Maude Babington
Chemical Manufacturers Association	Gordon Strickland
Defense Personnel Support Center	Nathan Gwertz
Department of Commerce	Richard Meyers
District Wholesale Drugs	John Pinelle
Drug Enforcement Administration	Robert Pearson, Pat Good

COMPANIES/AGENCIES	INDIVIDUALS
Federal Register	Roy Nanovic
Federal Emergency Management Agency	Victor Esch
Food and Drug Administration	Buddy Stonecipher, Lynn Huntington, Pete Shandruck, Gerald Quinnan Anastasia Perez, Tom Bozzo, Willie Bryant
Generic Pharmaceutical Industry Association	Catherine McCormack
National Association of Pharmaceutical Manufacturers	George Schwartz
Nuclear Regulatory Commission	Bernard Weiss
Oak Ridge National Laboratories	Doug Lee
Penick Corporation	Joseph Baorto
Pharmaceutical Manufacturers Association	John Jennings, Paul Kaufman, Thomas White
Pfizer	Paul Pendorf
Smith, Kline & French Laboratories	Edmund Pyle, John Lambdin, James Russo, George Martin
Sterling Hobe Corporation	Ivars Gutmanis
Washington Wholesale Drug	David Weiner

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

B

TECHNICAL DATA FOR MEA PAPER:

CRISIS IMPLEMENTATION OF EMP MITIGATION PROCEDURES

AT BROADCAST STATIONS

DECEMBER 1986

TITAN SYSTEMS, INC.
1950 GALLOWS ROAD
VIENNA, VA 22180

TABLE OF CONTENTS

ACTION: CRISIS IMPLEMENTATION OF EMP MITIGATION PROCEDURES AT BROADCAST STATIONS

I. PURPOSE OF ACTION

A. Circumstances - In the event that an international crisis were to occur before peacetime EMP hardening of broadcast stations could be implemented on a large scale, the purpose of this action would be to increase the number of broadcast stations which can withstand the effects of electromagnetic pulse (EMP).

B. Timeframe - This document explores the means by which the government could request broadcast stations during an international crisis to implement EMP mitigation procedures within either:

- 2-4 hours, or
- 1-2 weeks.

C. Summary of EMP mitigation procedures

- 2-4 hours
  - Unplug all connections (RF, landline, AC)
  - Store small/medium sized equipment in metal container or container wrapped in tin foil
  - Remove digital circuit cards from backplanes
- 1-2 weeks
  - Installation at power sources of metal oxide varistors
  - Installation of gas tube arrestors on transmitters
  - Installation of plug-in power protectors on unused power outlets
  - Installation of low-rf-impedence counterpoise at facility entry point of long external conductor runs
  - Installation of filters or loop antenna on EBS monitoring equipment to block out transmitter interference
  - Unplug unhardened connections (RF, landline, AC)
  - Store spare small/medium equipment in metal container or container wrapped in tin foil
- Guidelines for EMP mitigation procedures
  - General industry guidelines for 2-4 hour procedures
  - Station-specific guidelines for 1-2 week procedures

II. ALTERNATIVE LEVELS OF IMPLEMENTATION

Five levels of implementation are described in this section. Each represents a separate option to implement crisis EMP mitigation procedures at broadcast stations. The five levels are:

Option A: Government requests voluntary cooperation from broadcast industry to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours.

Option B: Government offers limited financial, logistical, or technical assistance to stations to implement EMP mitigation procedures for critical transmission equipment within 1-2 weeks.

Option C: Government activates standby voluntary agreements with industry to implement EMP mitigation procedures for critical transmission equipment in either 2-4 hours or 1-2 weeks depending upon the agreements which had been negotiated with individual companies.

Option D: Government activates standby agreements with industry to implement EMP mitigation procedures for critical transmission equipment in 1-2 weeks which include limited financial, logistical, or technical assistance.

Option E: Government orders EBS stations to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours pursuant to regulations not currently in existence.

A selected option would be chosen only in the event of an international crisis. All of the options require some preparatory activities. The five options are listed in order of increasing government involvement in their implementation.

A. Government requests voluntary cooperation from broadcast industry to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours.

- Prior to crisis, government has written general guidelines on EMP mitigation procedures and has provided them to industry
- May require declaration of national emergency to help motivate industry compliance
- Industry fully responsible for
  - Following procedures
  - Providing necessary parts and tools
- Industry bears cost
- No crisis implementation cost to government

B. Government offers limited financial, logistical, or technical assistance to stations to implement EMP mitigation procedures for critical transmission equipment within 1-2 weeks.

- Prior to crisis, government has written expedient EMP mitigation guidelines and has provided them to industry
- No prior government coordination or agreements with industry
- May require declaration of national emergency to help motivate industry compliance and to obtain Congressional approval to fund industry reimbursement
- Government assumes one or more of the following on an ad hoc basis
  - Cost of parts and/or tools
  - Provision of parts and/or tools
  - Transportation
  - Technical assistance
    - -- Additional information
    - -- Personnel

C. Government activates standby voluntary agreements with industry to implement EMP mitigation procedures for critical transmission equipment in either 2-4 hours or 1-2 weeks depending upon the agreements which had been negotiated with individual companies.

- During peacetime, government negotiates standby voluntary agreements with industry; Section VII, Supporting Material, lists items to be negotiated in agreements
- As part of agreements, government provides industry with guidelines on expedient EMP mitigation procedures
- Government notifies industry to activate agreements
- Implementation details determined in advance on a company by company basis with industry association involvement
- Industry bears all costs
- Industry fully responsible for
  - Following procedures
  - Providing necessary parts and tools
- No crisis implementation cost to government

D. Government activates standby agreements with industry to implement EMP mitigation procedures for critical transmission equipment in 1-2 weeks which include limited financial, logistical, or technical assistance.

- During peacetime, government negotiates standby voluntary agreements with industry; Section VII, Supporting Material, lists items to be negotiated in agreements
- As part of agreements, government provides industry with guidelines on expedient EMP mitigation procedures
- Government notifies industry to activate agreements
- Implementation details determined in advance on a company by company basis with industry association involvement
- Government assumes one or more of the following
  - Cost of parts and/or tools
  - Provision of parts and/or tools
  - Transportation
  - Technical assistance
    - -- Additional information
    - -- Personnel

E. Government orders EBS stations to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours.

- Currently, there is no authority for this type of action
- EBS regulations would need to be modified during peacetime to require stations to comply with EMP mitigation requirements in a crisis
- Government would need to have general procedural guidelines written in advance
- Once authority is in existence, government can activate authority and enforce implementation of EMP mitigation procedures for critical transmission equipment
- Penalty for non-compliance must be set at level high enough to ensure adequate protection
- Government provides industry with procedural guidelines
- Industry fully responsible for
  - Following procedures
  - Providing necessary parts and tools
- Government reimburses industry for costs

- This option designed to be used only if industry refuses to cooperate with voluntary measures or standby agreements

III. AUTHORITIES

A. 47 U.S.C.

- 606 (c) - President may suspend rules and regulations applicable to radio stations or to electromagnetic radiation control.
- 606 (e) - The President shall ascertain the just compensation for such use or control of the broadcasters facilities during emergencies and certify the amount ascertained to Congress for appropriation and payment to the person entitled thereto. If the amount is unsatisfactory to the person entitled, shall only be paid 75 per cent of desired amount and may sue the United States for the remaining amount.
- 214 (a) - Allows the extension of lines or discontinuance of service during temporary or emergency periods.

B. Executive Order

- 12046, Sec. 4 (103) - The Director of the Office of Science and Technology Policy shall prepare Presidential policy options with respect to the evaluation, by appropriate means, of the capability of existing and planned communication systems to meet national security and emergency preparedness requirements.
- 11556, Sec. 2 (i) - Assigns telecommunication functions in cooperation with Federal Communications Commission comprehensive long range plans for improved management of all electromagnetic spectrum resources in national emergencies.

C. 47 CFR

- 0.181 (h) - The defense commissioner and two alternate defense commissioners are designated by the FCC to be responsible to approve national emergency plans and develop preparedness programs, to include protecting broadcasting facilities from electromagnetic radiation.
- 0.182 (a) - The commission assigns the managing director to recommend national emergency plans and preparedness programs covering: provision of service by common carriers, broadcasting facilities and the safety and special radio

services; radio frequency assignment and electromagnetic radiation; investigation and enforcement.

- 0.183 (4) - The Emergency Communications Division under supervision of the managing director develops preparedness programs covering control of non-federal government radio stations in an emergency.

IV. EXPECTED BENEFITS

General - Benefits of expedient EMP mitigation procedures

- Improves the survivability of broadcast capability
- Enhances possibility of providing survivors with critical information postattack

A. Benefits of Option A - Government requests voluntary cooperation

- Simple approach - industry responsible for crisis action

B. Benefits of Option B - Government offers limited financial, logistical, or technical assistance

- Industry may be more cooperative if government provides assistance
- Technical and logistical assistance may make effective EMP mitigation possible on a widespread basis

C. Benefits of Option C - Government activates standby voluntary agreements

- Since agreements would be negotiated in peacetime, this option allows time for more station-specific EMP mitigation procedures to be developed
- Ensures that the necessary parts and tools will be available
- Ensures higher rate of compliance due to previous agreements

D. Benefits of Option D - Government activates standby agreements which include limited financial, logistical, or technical assistance

- Since agreements would be negotiated in peacetime, this option allows time for more station-specific EMP mitigation procedures to be developed
- Ensures that necessary parts and tools will be available

- Technical and logistical assistance could make for more effective EMP mitigation

- Allows time for training of station engineers, as necessary

- Industry may be more cooperative if government provides assistance

E. Benefits of Option E - Government orders broadcast industry to implement EMP mitigation procedures for critical transmission equipment

- Could make the action possible if industry is unwilling to cooperate voluntarily

V. EXPECTED COST

General - The estimated cost elements for implementation of expedient EMP mitigation procedures at broadcast stations are listed below. These costs are derived from discussion with industry experts. They do not result from an in-depth cost analysis.

- Costs per station to industry:

  - 2-4 hour procedures
    -- Parts: $150.00 (metal containers or foil)
    -- Labor: $200.00 (4 man hours)
  - 1-2 weeks procedures
    -- Parts: $2,000.00 (2/3 peacetime parts cost)
    -- Labor: $8,000.00 (160 man hours)

- Maximum estimated cost per station to government (e.g., if government pays all) if assistance is provided:

  -- Parts: $2,000.00
  -- Direct labor or technical support: $8,000.00
  -- Logistical support: $500.00 (8 man hours, truck, fuel)

- Cost to government for peacetime development of generic (i.e., not station-specific) guidelines

  - 2-4 hour procedures: $208,000.00 (2 man years) +
  - 1-2 week procedures: $208,000.00 (2 man years)* +

- Peacetime cost to government for expert to visit and assess station for specific (i.e., non-generic) characteristics: $1,000.00 (2 man days) per station plus travel

*May require measurement/testing of specific equipment
+Cost based on quasi-rule making under Administrative Procedures Act

NOTE: 1 man hour = $50.00

- Cost to government for peacetime negotiated agreements, per station: $4,500.00 (2 man weeks)

- Cost to government for peacetime training program

  - For government employees: $3,000.00 per person**
  - For broadcast employees: $1,500.00 per person

A. Expected Cost Of Option A - Government requests voluntary industry cooperation for implementing EMP mitigation procedures within 2-4 hours

- Cost to industry per station: $350.00

- Cost to government per station: none

- Peacetime cost to government: $208,000.00

B. Expected Cost of Option B - Government offers limited financial, logistical, or technical assistance for industry to implement EMP mitigation procedures within 1-2 weeks

- Cost to industry per station: undetermined percentage of $10,000.00

- Cost to government per station: undetermined balance of industry's percentage $10,000.00

- Peacetime cost to government: $208,000.00

C. Expected Cost of Option C - Government activates voluntary agreements to implement EMP mitigation procedures for critical transmission equipment in either 2-4 hours or 1-2 weeks

- Cost to industry per station:

  - 2-4 hour procedures: $350.00
  - 1-2 week procedures: $10,000.00

- Cost to government per station: moderate administrative expense

- Peacetime cost to government

  - Per station negotiations: $4,500.00
  - Development of guidelines: $416,000.00
  - Station survey cost: $1,000.00 plus travel per station

- Peacetime cost to industry per station negotiations: $17,000.00

**Assumes qualified personnel, cost includes salary for 1 week plus cost of course

NOTE: 1 man hour = $50.00

D. Expected Cost of Option D - Government activates standby agreements for implement EMP mitigation procedures for critical transmission equipment in 1-2 weeks which include limited financial, logistical, or technical assistance

- Cost to industry per station: undetermined percentage of $10,000.00
- Cost to government per station: undetermined balance of industry's percentage of $10,000.00
- Peacetime cost to government
  - Per station negotiations: $4,500.00
  - Development of guidelines: $208,000.00
  - Station survey cost: $1,000.00 plus travel per station
  - Training
    -- For government employees: $3,000.00 per person
    -- For broadcast employees: $1,500.00 per person
- Peacetime cost to industry per station negotiations: $17,000.00

E. Expected Cost to Option E - Government orders EBS stations to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours

- Cost to industry per station: moderate administrative costs
- Cost to government per station: $350.00
- Peacetime cost to government:
  - Modification of existing FCC regulations: high administrative costs
  - Development of guidelines: $208,000.00
  - Station survey cost: $1,000.00 plus travel per station

VI. IMPLEMENTATION PROCESS

For the five options, the crisis period implementation process is:

A. Option A - Government requests voluntary cooperation from industry to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours

- FEMA regional offices (or FCC) contact selected TV and radio stations
  - Request minimum EMP mitigation of selected equipment
  - Ensure that stations have procedural guidelines
- Stations implement EMP mitigation procedures for critical equipment

B. Option B - Government offers limited financial, logistical, or technical assistance to stations to implement EMP mitigation procedures for critical transmission equipment within 1-2 weeks

- FEMA regional offices (or FCC) contact selected TV and radio stations
  - Request minimum EMP mitigation of selected equipment
  - Offer limited financial, logistical, or technical assistance, as necessary
  - Ensure that stations have EMP mitigation guidelines
- FEMA sends request for supplemental funds to the Office of Management and Budget (OMB)
- FEMA sends parts, transportation, and/or personnel to TV and radio stations, as necessary
- Stations implement EMP mitigation procedures for critical equipment
- Companies submit requests for reimbursement to FEMA, where applicable
- FEMA reimburses companies for cost of parts, as agreed

C. Option C - Government activates standby voluntary agreements with industry to implement EMP mitigation procedures for critical transmission equipment in either 2-4 hours or 1-2 weeks depending upon the agreements which had been negotiated with individual companies.

- FEMA regional offices (or FCC) notify TV and radio stations with standby agreements to activate those agreements
- Stations implement EMP mitigation procedures for critical equipment

D. Option D - Government activates standby agreements with industry to implement EMP mitigation procedures for critical transmission equipment in 1-2 weeks which include limited financial, logistical, or technical assistance

- FEMA regional offices (or FCC) notify TV and radio stations with standby agreements to activate those agreements
- FEMA notifies OMB of intention to draw on emergency funds
- FEMA sends parts, transportation, and/or personnel to TV and radio stations in accordance with agreements
- Stations implement EMP mitigation procedures for critical equipment
- Companies submit requests for reimbursement to FEMA
- FEMA reimburses companies for cost of parts in accordance with financial assistance agreements

E. Option E - Government orders EBS stations to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours

- FCC activates emergency provisions of the EBS regulations (not currently in existence)
- FEMA notifies OMB of intention to draw on emergency funds
- FEMA regional offices contact selected EBS stations
  - Directs them to implement EMP mitigation procedures
  - Ensures that they have EMP mitigation guidelines
- Stations implement EMP mitigation procedures for critical equipment

VII. SUPPORTING MATERIAL

A. Reasons for expedient EMP mitigation at broadcast stations

- Communications equipment is vulnerable to the effects of EMP
- Majority of TV and radio stations not currently EMP hardened (see Figure 1)
- Funding for EMP hardening of EBS stations during peacetime is very low
  - Only a small percentage of radio stations are being hardened
  - No TV stations are being hardened
- Hardened stations are not being inspected periodically to ensure integrity of hardening or identify potential upgrading
- The advantage of crisis EMP mitigation procedures vs. peacetime EMP hardening is that stations are more likely to cooperate during a crisis
- Disadvantages of crisis EMP mitigation vs. peacetime
  - 2-4 hour EMP mitigation procedures
    - -- Not enough time to harden adequately
    - -- Absolute minimum equipment hardened
    - -- Procedural rather than physical hardening
    - -- Possibility that many stations may not be able to respond in that time period
  - 1-2 week EMP mitigation procedures
    - -- May not have time to complete
    - -- Only transmitter sites with minimum studio equipment are hardened

B. Critical Transmission Equipment

The following equipment has been identified as being the minimum critical equipment which should be EMP hardened during a crisis in order to increase the probability that a given station will be able to broadcast following electromagnetic pulse:

- Antenna feeds
- Transmitter
- Control circuits for backup power generator
- AC power connections
- EBS monitoring equipment
- Microphone
- Audio mixer
- Audio tape (cassette) recorder
- Transmitter monitoring equipment

FIGURE 1

EMP PROTECTED RADIO STATIONS AS OF 4/17/84*

ALABAMA

WERC Birmingham

ARIZONA

KDJI Holbrook
KAAA Kingman
KYCA Prescott

ARKANSAS

KAAY Little Rock

CALIFORNIA

KRED Eureka
KXRX San Jose
KVEC San Luis Obispo
KFBK Sacramento
KFI Los Angeles
KCBQ San Diego
KCNO Alturas
KMJ Fresno

COLORADO

KVFC Cortex
KOA Denver
KIUP Durango
KREX Grand Junction
KIDN Pueblo

CONNECTICUT

WTIC Hartford

FLORIDA

WIOD Miami

GEORGIA

WSB Atlanta
WMAZ Macon
WGPC Albany
WCUP Tifton

ILLINOIS

WMAQ Chicago

IOWA

WOC Davenport
WHO Des Moines

KANSAS

KXXX Colby
KGNO Dodge City
KOAM Pittsburg
WREN Topeka
WIBW-FM Topeka
KFH Wichita

KENTUCKY

WHAS Louisville

MICHIGAN

WKZO Kalamazoo

MINNESOTA

WCCO Minneapolis

MISSISSIPPI

WJDX Jackson

MISSOURI

KLIK Jefferson City
KJFF-FM Jefferson City
WDAF Kansas City
KIRX Kirksville
KMOX St. Louis
KWTO Springfield

MONTANA

KFLN Baker
KGHL Billings
KBOZ Bozeman
KBOW Butte
KMON Great Falls
KMTX Helena
KLCB Libby
KATL Miles City
KSEN Shelby
KVCK Wolf Point

NEBRASKA

KMMJ Grand Island
KFOR Lincoln
KSWN McCook
WJAG Norfold
KFAB Omaha

NEVADA

KVLV Fallon

NEW MEXICO

KOB Albuquerque

NEW YORK

WGY Schenectady
WCBS New York

NORTH CAROLINA

WSOC Charlotte
WPTF Raleigh
WQDR Raleigh

NORTH DAKOTA

KFYR Bismark
KDLR Devils Lake
KFGO Fargo
KNOX Grand Forks
KEYZ Williston

*Due to lack of follow-up inspection, it is estimated that only 40% of stations listed are actually EMP hardened.

EMP PROTECTED RADIO STATIONS AS OF 4/17/84
(cont)

OKLAHOMA

WKY Oklahoma City
KOMA Oklahoma City
KRMG Tulsa

SOUTH CAROLINA

WIS Columbia

SOUTH DAKOTA

KSDN Aberdeen
KOTA Rapid City
KSOO Sioux Falls

TENNESSEE

WSM Nashville

TEXAS

KCRS Midland
WOAI San Antonio

UTAH

KSUB Cedar City
KDOT Provo
KSL Salt Lake

WEST VIRGINIA

WCAW Charleston

WYOMING

KTWO Casper
KFBC Cheyenne
KIML Gillette
KWYO Sheridan

TV station additional equipment:

- Video tape (cassette) recorder
- Video camera
- Video monitor
- 2x1 switch

C. Industry views on feasibility of crisis EMP mitigation procedures

- Views differ on industry cooperation during a crisis
  - Some believe industry will cooperate
    - -- Will be interested in protecting equipment
    - -- Stations that will not install equipment now due to need to go off-air during installation may be more willing to make this sacrifice during a crisis
  - Some believe adequate technical manpower would not be available during a crisis to perform hardening
    - -- Minimum availability during peacetime
    - -- People may be more concerned with protecting themselves than equipment
  - Some believe government should perform or review installation to ensure technical correctness

- Transmitters generally located away from studio
  - Some sites (particularly CPCS-1 EBS stations) have small studios at transmitter sites
  - Studio equipment might need to be transported to site if none there normally
    - -- Spare equipment available at some stations
    - -- Portable news equipment could be moved to transmitter site, if necessary
  - Without EBS monitoring equipment at transmitter site, stations may not be able to function as EBS stations

- Some question effectiveness of expedient EMP mitigation procedures
  - 2-4 hour procedures not truly EMP hardening
  - 1-2 week mitigation may be incomplete

- Not all stations have backup transmitters or backup power generators
  - Makes 1-2 week EMP mitigation more attractive in terms of higher protection level
  - Perception is that installation would have to occur off-air

- If cost of parts is $2,000 to $3,000, stations may be willing to cover costs since this is minimal in comparison to cost of broadcast equipment

D. Industry views on alternative actions

- Option A: Government requests voluntary industry cooperation for implementing EMP mitigation procedures within 2-4 hours

  - Industry probably would be willing to perform 2-4 hour procedures if government provides industry procedural guidelines in advance
  - Potential problems
    -- No personnel at transmitter site at the time of the request
    -- No studio equipment at transmitter site at time of request

- Option B: Government offers limited financial, logistical, or technical assistance to stations to implement EMP mitigation procedures for critical transmission equipment within 1-2 weeks

  - Industry probably would be willing to perform 1-2 week EMP procedures if government assists
  - If industry believed in seriousness of crisis probably would be willing to fund
  - Advantages over Option A
    -- Provides greater protection
    -- Allows time to transport studio equipment to transmitter site
    -- EMP mitigation better due to
    oo Technical assistance from government
    oo Installation of protective devices
  - One suggestion: that a peacetime information program provide some information in advance so technicians are not taken completely by surprise

- Option C: Government activates standby voluntary agreements with industry to implement EMP mitigation procedures for critical transmission equipment in either 2-4 hours or 1-2 weeks depending upon the agreements which had been negotiated with individual companies.

  - Industry probably would be willing to perform 2-4 hour procedures if government provides guidelines in advance
  - Industry willingness to fund 1-2 week effort would probably vary depending on type of stations but essentially if industry believed in seriousness of crisis, probably would be willing to fund

-- Clear channel AM stations (i.e., stations which have sole use of a frequency nationwide) and large FM stations most likely to be able to afford the expense
-- Small AM stations have financial difficulties under normal conditions
-- TV stations cannot afford to broadcast without advertising revenue because of the high cost of electric power; thus some believe TV stations may intend to be off-air during crisis and may not feel EMP mitigation worth the expense

- Option D: Government activates standby agreements with industry to implement EMP mitigation procedures for critical transmission equipment in 1-2 weeks which include limited financial, logistical, or technical assistance

  - Incentives for participation
    -- Government provision of protective devices
    -- Government provision of technical assistance
  - This may be the preferred industry option because combination of prior planning and government assistance would allow for most efficient EMP mitigation within the time constraints

- Option E: Government orders EBS stations to implement EMP mitigation procedures for critical transmission equipment in 2-4 hours

  - Not considered appropriate
  - Not enforceable in time to meet need if crisis develops into war

E. Items to be negotiated in government-industry standby agreements (Options C and D)

- Whether plans will be made based on procedures for 2-4 hours or 1-2 weeks (Option C only)

- Identification of specific equipment to be covered

- Level of industry participation in development of guidelines

  - General guidelines
  - Station-specific guidelines

- Whether station technicians should participate in a peacetime training program

- Additional items to be negotiated only for Option D include government role in providing

- Reimbursement for parts or tools
- Provision of parts or tools
- Transportation of studio equipment to transmitter site
- Technical assistance
  -- Information
  -- Personnel

F. Government preparatory activities which need to take place during peacetime

- Determine if critical equipment list is complete (see Section VII. B, above)

- Determine which stations should be contacted to participate in EMP mitigation in order to ensure nationwide media coverage

  - All EBS radio and TV stations
  - All commercial radio and TV stations
  - EBS CPCS-1 stations only
  - Large radio and TV stations only
  - Radio only

- Develop written EMP mitigation guidelines

  - 2-4 hour procedural guidelines
  - 1-2 weeks
    -- General
    -- Station-specific requiring review of station equipment and facilities

- Develop training program (if applicable)

  - For government technical staff
  - For broadcast station engineers

- If Options B, D, or E (limited financial, logistical, or technical assistance)

  - Prepare a budget for funds which would be drawn on only in an emergency
  - Submit to OMB for inclusion in federal budget

- If Options C or D (standby agreements) are being considered

  - Identify government negotiation team
    -- FEMA
    -- FCC
    -- NSC
    -- NCS
  - Contact selected broadcast companies and begin negotiation on a company by company basis

G. References

- Barnes, Paul R. The Effects of Electromagnetic Pulse (EMP) on State and Local Radio Communications. ORNL, October 1973.
- FEMA, Attack Environment Manual, "Chapter 4, What the Planner Needs to Know About Electromagnetic Pulse," CPG 2-1A4, May 1982.
- FEMA, Electromagnetic Pulse, Protection Guidance, CPG 2-17, January 1986.
- FEMA, Electromagnetic Pulse, Protection Support. FEMA Manual 9300.1. September 1985.
- National Communication System. Electromagnetic Pulse/ Transient Threat Testing of Protection Devices for Amateur/Military Affiliate Radio System Equipment. Vol. 1. October 1985.

H. Organizations and Persons Contacted

COMPANIES/AGENCIES	INDIVIDUALS
CBS	Robert O'Connor
Edens Broadcasting, Inc. (owns 7 radio stations)	James H. Hoke
Federal Communications Commission	Ray Seddon
Federal Emergency Management Agency	Russell Gates
Oak Ridge National Laboratories	Michael Buchanan
National Association of Broadcasters	Ralph Justice
WETA - Radio and TV	Ed Dalton
WMAL Radio	Rick King
WTOP Radio	Granville Klink

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TECHNICAL DATA FOR MEA PAPER:

CRISIS DISPERSAL OF PETROLEUM PRODUCTS

DECEMBER 1986

TITAN SYSTEMS, INC.
1950 GALLOWS ROAD
VIENNA, VA 22180

TABLE OF CONTENTS

CRISIS DISPERSAL OF PETROLEUM PRODUCTS

I. PURPOSE OF ACTION

To enhance the availability of critical petroleum products after a nuclear attack through pre-attack coordination of industry and government in the dispersal of these resources from high risk primary storage to lower risk secondary and tertiary storage.

A. Definitions

- Primary petroleum storage (industry owned)
  - Refinery product tankage
  - Bulk terminals - non-consumer storage having storage capacity greater than 50,000 barrels or that receives petroleum products by barge, tanker, or pipeline
- Secondary petroleum storage (industry owned)
  - Bulk plants - storage facilities having total storage capacity less than 50,000 barrels and which do not receive petroleum products by barge, ship, or pipeline
  - Retail fuel outlets
    - -- Service stations
    - -- Truck stops
    - -- Convenience stores
- Tertiary petroleum storage (consumer owned) (end user storage)
  - Agriculture
  - Commercial
  - Electric utilities
  - Industrial
  - Military/government
  - Residential
  - Transportation

B. Postattack Critical Petroleum Products*

- Distillate Fuel Oil
  - No. 1 Distillate
    - Fuel Oil
    - Diesel Fuel
  - No. 2 Distillate
    - Fuel Oil
    - Diesel Fuel
  - No. 4 Fuel
- Residual Fuel Oil
- Jet Fuel
  - Kerosine-type
  - Naphtha-type
- Gasoline

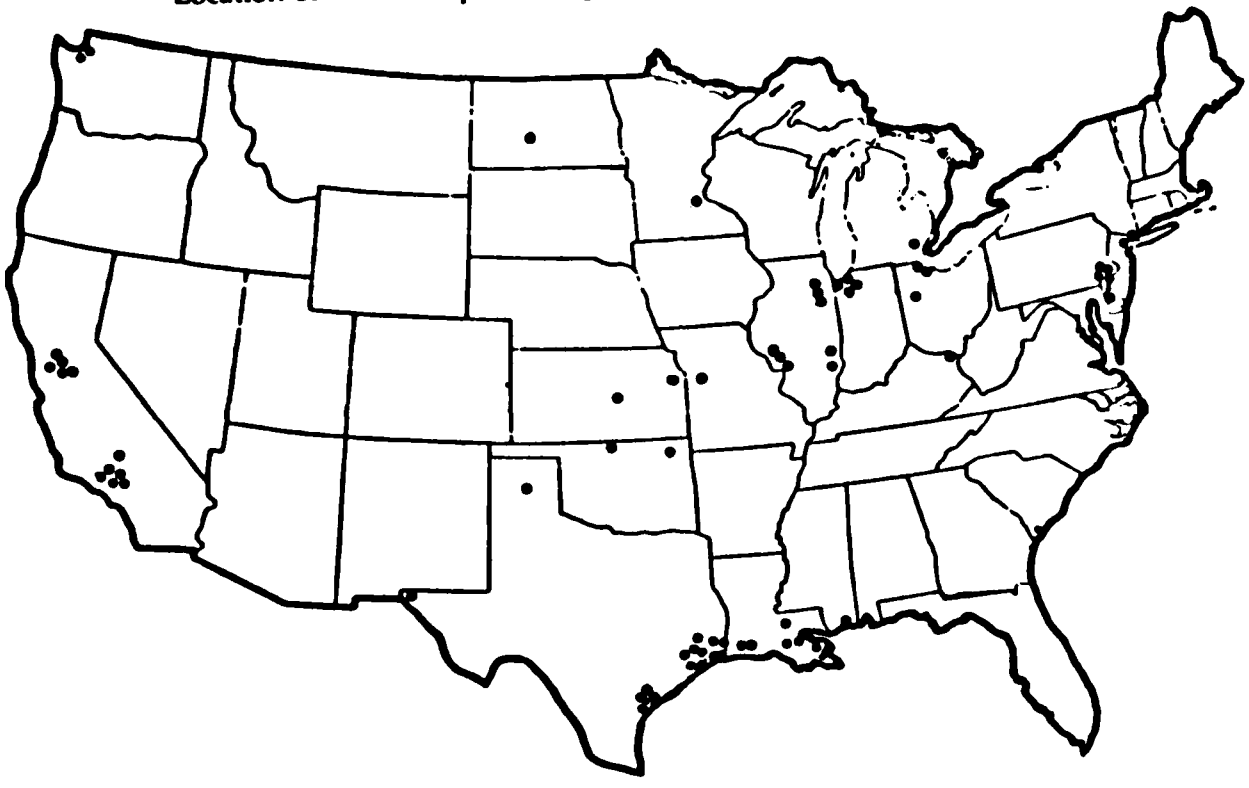
*Refiners are listed in Table 32 of Petroleum Supply Annual 1985, Vol 1.

C. Reasons for Crisis Dispersal

- Currently 216 operable refineries in the U.S.
- Refineries and crude oil pipelines are concentrated in a few areas of the country (see Figures 1 and 2), are vulnerable and not expected to survive a large scale attack in large numbers; refining industry cannot be quickly rebuilt
- One hundred fewer operable refineries exist today than five years ago due to drop in energy demand and industry efforts in production efficiency; industry consolidation efforts can be expected to continue
- Pipelines carry one-third of petroleum products yet are vulnerable and few in number (see Figure 3); ten "hits" could put the three largest petroleum product pipelines out of service
- Primary petroleum storage is concentrated in a few areas
- Secondary storage composed of
  - 18,000 companies operating bulk plants
  - 200,000 retail outlets

Figure 1

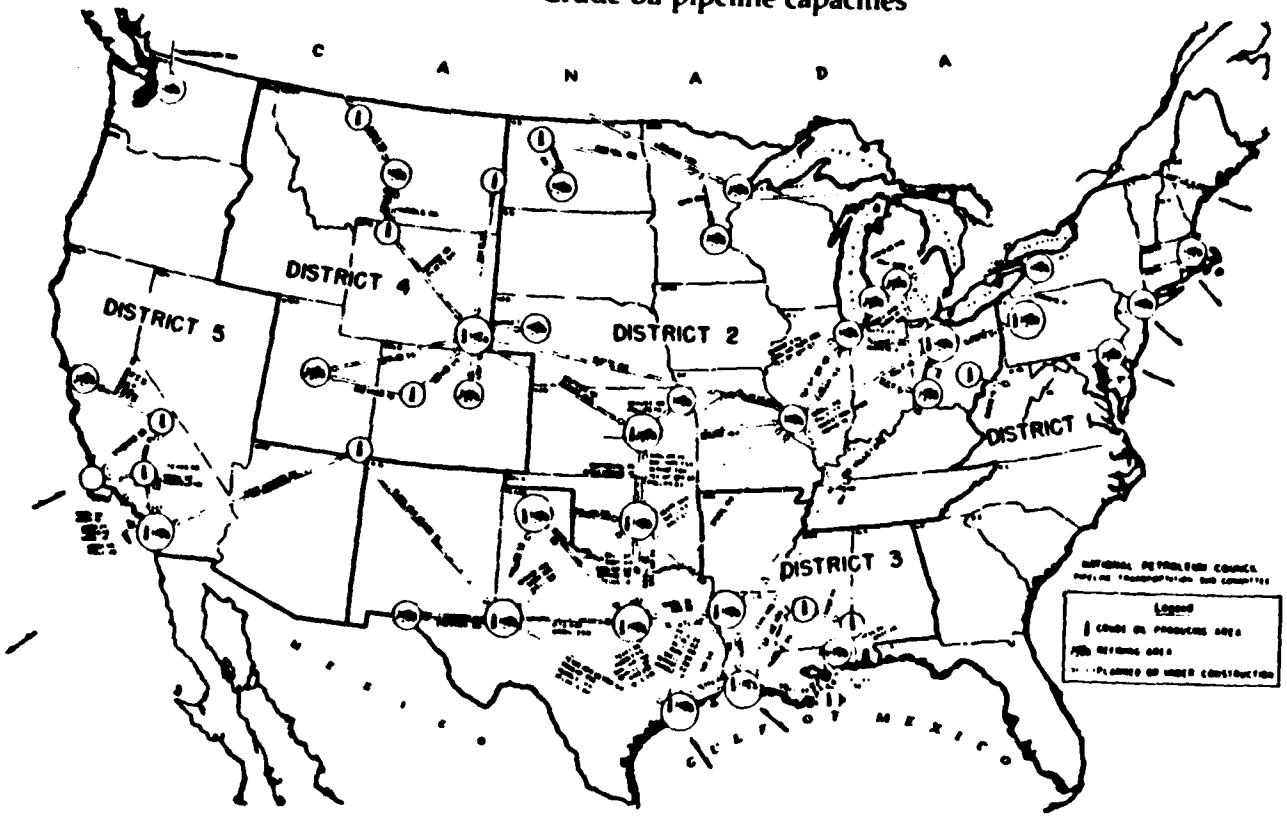
Location of refineries processing 50,000 barrels of crude oil per day or more



SOURCE: Stephens, Maynard M., "The Oil and Natural Gas Industries: A Potential Target of Terrorists," undated.

Figure 2

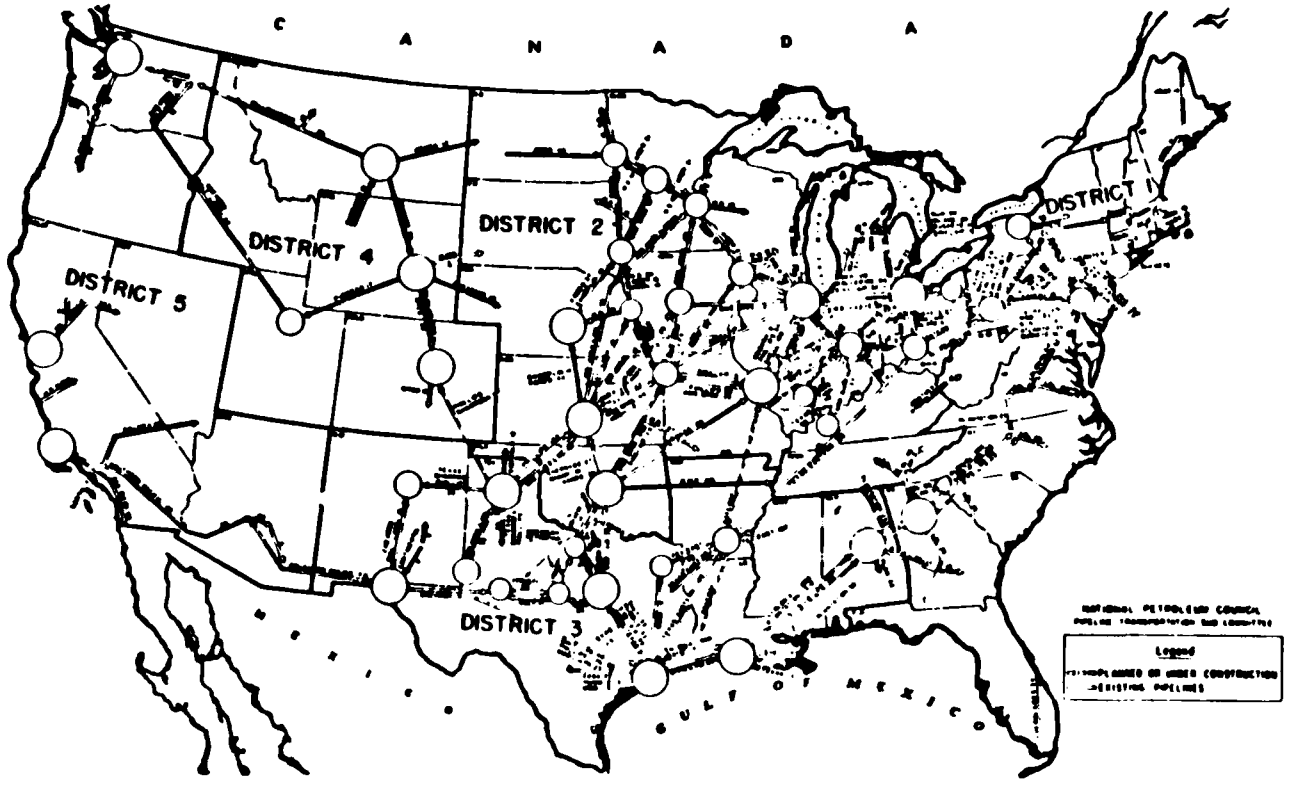
Crude oil pipeline capacities



SOURCE: Stephens, Maynard M., "The Oil and Natural Gas Industries: A Potential Target of Terrorists," undated.

Figure 3

Product pipeline capacities



SOURCE: Stephens, Maynard M., "The Oil and Natural Gas Industries: A Potential Target of Terrorists," undated.

Hence, secondary storage is much more dispersed than primary storage, although storage capacity is much less. At peacetime consumption rates, filling unused secondary storage may add up to seven days to available postattack petroleum supplies (see Figure 4).

- Tertiary storage is even more dispersed than secondary storage and has much greater storage capacity. At peacetime consumption rates, filling unused tertiary storage may add up to 24 days to available postattack petroleum supplies (see Figure 4).

- Motor fuel availibility would probably be one of the most limiting factors in meeting postattack transportation needs. Petroleum based fuel is basic to many military and civilian activities.

- Advantages of crisis dispersal vs. peacetime dispersal

  - No disruption to peacetime petroleum production
  - No incentive for industry to participate during peacetime

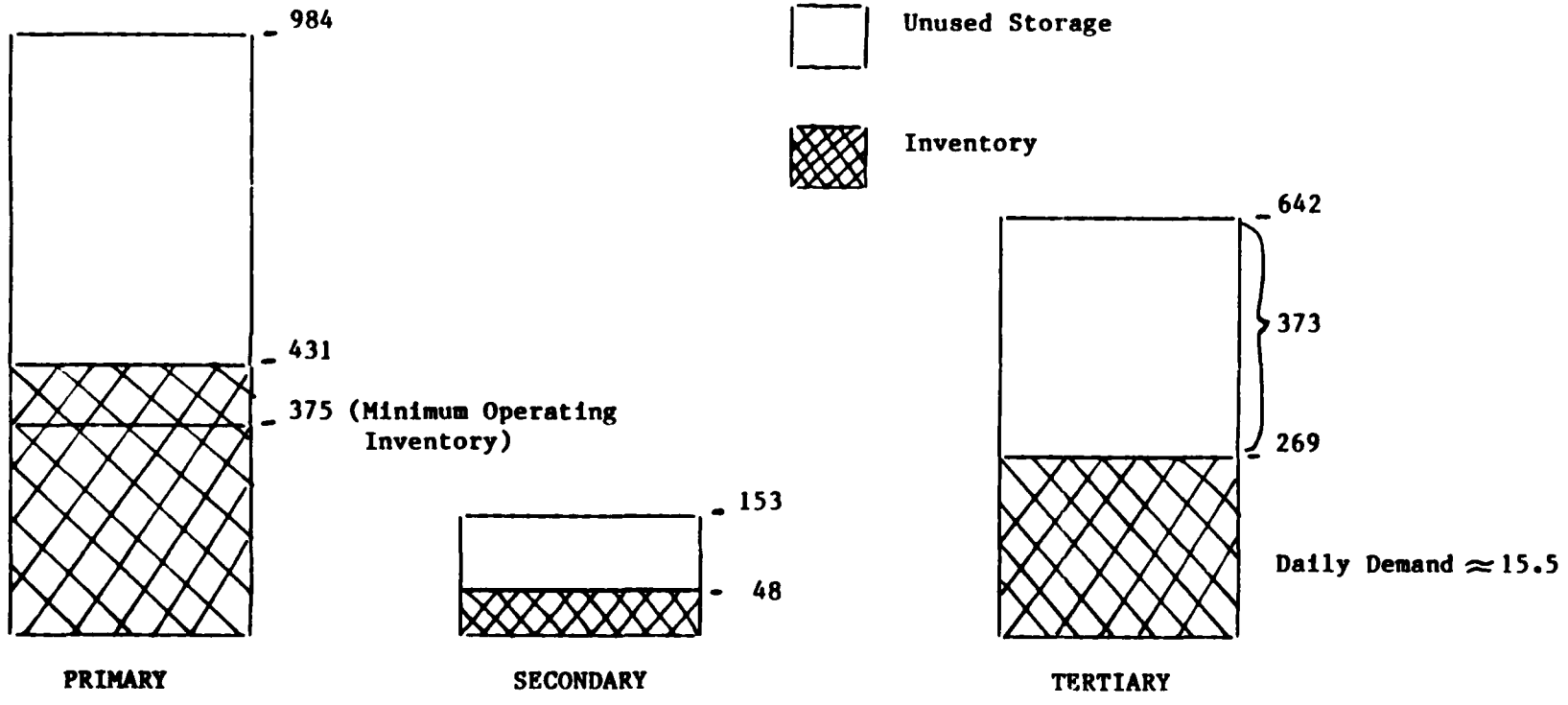
- Disadvantages of crisis dispersal

  - Logistics
    -- Rapid coordination among refiners, wholesalers, and retailers will be needed
    -- Consumer demand must be increased quickly so that petroleum can be rapidly dispersed to tertiary storage
  - Transportation
    -- Gas lines
    -- Expecting consumers to line up at the gas pump when an attack may be imminent
    -- Possible shortage of industry petroleum transportation
  - Industry disruption
    -- Possible financial hardship due to increased inventory costs at wholesale and retail level
    -- Keeping refineries and primary/secondary distribution systems operating when workers may feel an attack is imminent
    -- Difficulty in restarting operations should the crisis pass due to
      •• Decrease in consumer demand
      •• Financial problems caused by interruption of operations due to depleted inventories
      •• Mechanical problems caused by shutdown of operations due to depleted inventories

Figure 4

PETROLEUM STORAGE CAPACITY AND INVENTORY
AS OF MARCH 31, 1983

(millions of barrels)



SOURCE: National Petroleum Council, Petroleum Inventories and Storage Capacity, June 1984.

II. ALTERNATIVE LEVELS OF IMPLEMENTATION

Six implementation options are described in this section, one involving consumers, Option A, and five involving industry, Options B(1) through B(5). Each represents a separate option to implement dispersal of petroleum products to lower risk areas during a pre-attack crisis.

Action Involving Consumers

Option A: Government requests that petroleum consumers fill their tanks and implement a conservation program.

Actions Involving Industry

Option B(1): Government requests voluntary cooperation from industry to disperse petroleum products.

Option B(2): Government offers limited financial or logistical assistance to industry to disperse petroleum products.

Option B(3): Government activates standby voluntary agreements between government and industry.

Option B(4): Government activates standby agreements with industry which include limited financial or logistical assistance.

Option B(5): Government orders industry to disperse petroleum.

Implementation of the above options would only occur in the event of a crisis. All options require some preparatory activities. Further elaboration is provided below.

Option A: Government requests that petroleum consumers fill their tanks and implement a conservation program.

- Some prior government coordination with industry needed and agreements with industry desirable to help obtain industry cooperation as well
- Intent is to effect a transfer of products from industry primary and secondary storage to consumer-level tertiary storage

- Should be implemented as part of any plan to move large quantities of petroleum to lower risk areas; Options B(1) through B(5) below involving industry are of much greater utility when coupled with this action

- Government request is not for an increase in consumption; request is for the opposite: implement conservation

- Would not require declaration of national emergency

- Costs to government include

  - Government coordination and dissemination to media of consumer information needed to implement the option
  - Government planning to overcome possible
    -- Lines at service stations and retail outlets
    -- Petroleum shortages induced in some areas due to surge in consumer demand
  - Increase in public apprehension and calls upon the government to resolve the crisis

Option B(1): Government requests voluntary cooperation from industry to disperse petroleum products.

- If implemented, should be combined with Option A for more effective dispersal

- No cost to government

- Industry bears cost

- Some government coordination with industry beforehand

- Government requests that industry top off secondary storage tanks

- Government identifies to industry which petroleum products to disperse

- Government identifies to industry which petroleum storage facilities are considered to be high risk

- Government provides to industry dispersal plan timetable

- May require declaration of national emergency to help motivate industry compliance

- Industry fully responsible for:
  - Petroleum products
  - Movement of petroleum from primary to secondary storage
  - Secondary storage facilities
  - Inventory monitoring and reporting
  - Personnel
  - Security
- Petroleum at primary and secondary storage levels remains under the control and ownership of industry

Option B(2): Government offers limited financial or logistical assistance to industry to disperse petroleum products

- If implemented, should be combined with Option A for more effective dispersal
- Some prior government coordination with industry desirable
- Government requests that industry fill secondary storage tanks
- May need declaration of national emergency to help motivate industry compliance and to obtain congressional approval to fund industry reimbursement
- Government identifies to industry which petroleum products to disperse and which storage facilities are considered to be high risk
- Government provides industry dispersal plan timetable
- Industry fully responsible for petroleum products and inventory monitoring and reporting to government
- Government provides financial or logistical assistance for one or more of the following on an ad hoc basis:
  - Transportation means, e.g., authorizing additional vehicles under the Defense Production Act
  - Transportation costs
  - Reimbursement for loss of business due to interruption of operations; e.g., depletion of petroleum inventory below level needed to operate business
  - Increased inventory holding costs at secondary storage locations
  - Personnel
  - Security

Option B(3): Government activates standby voluntary agreements between government and industry

- If implemented, should be combined with Option A for more effective dispersal
- During peacetime, government negotiates voluntary agreements with industry; Section VI, Supporting Material, lists items to be negotiated in agreements
- Government notifies industry to activate plan for crisis petroleum dispersal (movement of petroleum from primary to secondary storage)
- No cost to government after negotiations of standby agreements
- Industry bears cost
- Implementation details determined in advance on a company by company basis with industry association involvement
- Will not require declaration of national emergency since industry cooperation has been previously obtained
- Petroleum products at primary and secondary storage remain under control and ownership of industry

Option B(4): Government activates standby agreements with industry which include limited financial or logistical assistance

- If implemented, should be combined with Option A for more effective dispersal
- During peacetime, government negotiates agreements with industry; Section VI, Supporting Material, lists items to be negotiated in agreements
- Government notifies industry to activate plan for crisis petroleum dispersal (movement of petroleum from primary to secondary storage)
- Implementation details determined in advance on a company by company basis with industry association involvement
- Will not require declaration of national emergency to obtain industry cooperation, unless congressional funding authorization for industry reimbursement is contingent upon such a declaration

- Government identifies to industry which petroleum products to disperse

- Government provides industry dispersal plan timetable

- Industry fully responsible for petroleum products and inventory monitoring and reporting

- Government provides financial or logistical assistance for one or more of the following:

  - Transportation means
  - Reimbursement for loss of business due to interruption of operations; e.g., depletion of petroleum inventory below level needed to operate business
  - Increased inventory holding costs at secondary storage locations
  - Personnel
  - Security

Option B(5): Government orders industry to disperse petroleum products

- If implemented, should be combined with Option A for more effective dispersal

- Government activates Section 101(b) of the Defense Production Act to enforce dispersal orders

- Government provides industry with a complete and precise set of instructions

- This option is designed to be used only if industry refuses to cooperate with voluntary measures or standby agreements

III. AUTHORITIES

A. Defense Production Act of 1950, as amended

- Sec. 101(a) (50 U.S.C. app. 2071(a)) - requires the priority performance of contracts and orders in support of approved programs and permits the allocation of resources and facilities to promote the national defense.

- Sec. 101(b) (50 U.S.C. 2071(b)) - authorizes the government to control the distribution of resources in the civilian market when a material is "scarce, critical, and essential to national defense."

- Title III, as amended 1984 (50 U.S.C. app. 2091, et. seq.) - authorizes the government to provide financial incentives to expedite productive capacity and supply.

- Sec. 708 - delegates authority to the President to consult with industry in order to enter into voluntary agreements with industry. (NOTE: EO 10480, Sec. 501 and 609, redelegates pertinent authorities with respect to petroleum to FEMA and DOE.)

B. Emergency Energy Conservation Act of 1979 - provides means for federal, state, and local governments to establish emergency conservation measures with respect to gasoline, diesel fuel, home heating oil, and other energy sources which may be in short supply and establishes emergency measures to alleviate disruptions in the marketing and distribution of these essential fuel supplies.

C. Emergency Petroleum Allocation Act of 1973 - grants President temporary authority to deal with shortages of crude oil, residual fuel oil, and refined petroleum products in their national distribution system.

D. Energy Emergency Preparedness Act of 1982 - provides for the Nation's energy emergency preparedness through storage and state-by-state statistics of inventories and sales commitments of petroleum products.

E. Energy Policy and Conservation Act of 1975 - is to increase domestic energy supplies and availability to restrain energy demand, to prepare for energy emergencies and for other purposes.

F. Energy Security Act of 1980 - Sec. 302 grants the President the authority to make provisions to fund essential contractors in expedient production and delivery of essential energy resources.

G. Energy Supply and Environmental Coordination Act of 1974 - provides for a means to assist in meeting the essential fuel needs of the United States and provide requirements for reports regarding resources.

H. Federal Energy Administration Act of 1974 - to conserve scarce energy supplies, to insure fair and efficient distribution of readily usable energy sources, and to assist in developing policies and plans to meet the energy needs of the Nation.

I. 42 U.S.C. Public Health and Welfare

- Sec. 6271 - grants the President authority over persons engaged in producing, transporting, distributing, or storing products in order to

take action he determines necessary to implement obligations of the United States in Chapters III and IV of the International Energy Program

- Sec. 8511 - Establishes conservation and inventory levels during emergencies statewide, relating to base period consumption reduced by a uniform nationwide percentage

- Sec 8532 - develops program to monitor middle distillates nationwide, such as warehousing, distributing, and selling

J. EO 10480 - Administration of Defense Mobilization Program

- Sec. 101 - delegates relevant functions to FEMA

- Part III - defines agency responsibilities in providing private sector financial incentives

- Sec. 501 - grants authority to USDA, DOC, DOI, DOT, and DOD to enter into agreements with industry; delegates President's authority to consult with industry to FEMA and delegates authority to OMB to develop guidelines and procedures for the establishment of advisory committees to assist with agreements

- Sec. 601 - defines the term "petroleum"

- Sec. 609 - transfers to DOE authorities and responsibilities initially delegated to DOI with respect to petroleum (et. sec. 201, 501)

K. EO 11490 - Assignment of Emergency Preparedness Functions to Federal Departments and Agencies

- Part 7 - assigns Department of Energy emergency responsibilities pertaining to petroleum and the National Defense Executive Reserve

- Part 11 - assigns Department of Justice responsibility to provide consultation in approving voluntary agreements between government and industry

- Part 22 - assigns Federal Emergency Management Agency responsibilities for coordination of all emergency preparedness activities of the federal government.

L. 10 CFR Series

- No. 477.21 - constitutes the standby federal energy conservation plan which reduces the public and private use of the energy source under the act
- No. 600 - sets criteria for government grants and sub-grants to energy industry and guidelines through completion of contract or project

M. 15 CFR Series

- No. 350 - Defense Priorities and Allocation System (DPAS) - A Department of Commerce regulation which provides a framework within the Department of Commerce for rapid industrial mobilization in a national emergency.

N. 44 CFR Series

- No. 323 - Defense Mobilization Order 4 - provides guidance on priority use of resources in the immediate postattack period
- No. 330 - develops policy guidance and delegation of authorities for use of priorities and allocations to maximize domestic energy supplies in accordance with subsection 101(c) of the DPA
- No. 332.2 - provides interagency policy guidelines for development, approval, and implementation of voluntary agreements

O. FPC-7 - provides general guidance for resource management in national emergencies

IV. EXPECTED BENEFITS AND COST

General benefits of dispersing petroleum products during a pre-attack crisis include the following:

- Improves survivability of petroleum supplies through relocation from high-risk areas where most refineries, pipelines, and bulk terminal storage are located to much more dispersed secondary and tertiary storage
- Dispersing petroleum only to secondary storage is of marginal benefit since additional capacities are limited (see Figure 4)

- Dispersing petroleum to tertiary storage is of significant benefit since additional capacities are much greater (see Figure 4) and are more dispersed than secondary storage

- Dispersing petroleum to secondary and tertiary storage reduces dependency on vulnerable refineries, crude oil supply networks, and the primary petroleum distribution system to supply petroleum in the immediate postattack

- Improves availability of petroleum supplies to consumers and industry in the immediate postattack

General costs or negative aspects of petroleum dispersal during a crisis include the following:

Costs To Industry

- Increased inventory carrying costs to the secondary storage system (bulk plants and retail outlets)

- Less flexibility in

  - Changing refinery product yields if primary or secondary storage is filled
  - Adjusting inventories to reflect expected future petroleum prices if primary or secondary storage is filled

- Possible problems and shortages in some primary/secondary distribution systems if primary petroleum supplies are reduced below "minimum operating inventory" levels

- Possible hoarding by secondary storage operators to drive prices up

- Weakening of industry control of petroleum distribution

- Increased wholesale/jobber/retailer costs

- Increased transportation costs to disperse products

- Less flexibility in redirecting petroleum products to customer sectors or geographic areas if increased consumer demand depletes primary/secondary inventories

- Glut in market could have short-term effects on production and prices of products if crisis is resolved peacefully

Cost To Consumers

- Increased danger to public safety caused by unsafe tertiary storage methods
- Increase in public apprehension
- Shortages of petroleum supplies in some parts of the country due to depleted secondary tanks caused by surge in consumer demand
- Possible need to institute fuel rationing in some parts of the country due to supply problems
- Greater difficulty in replenishing supplies from depleted secondary tanks
- Expenditures needed to top off tanks
- Possible long lines at the gas pump and retail outlets

Costs To The Government

- Costs and manpower needed to coordinate actions with industry during peacetime and execute and monitor progress during crisis
- Need to determine guidelines to industry concerning which petroleum storage facilities are both critical and high risk, and thus warrant crisis dispersal of products
- Possible strain on relations with industry due to perceived industry opposition to crisis petroleum dispersal
- Possible weakening of government credibility should crisis pass
- Will increase national and international pressure to resolve crisis; could be viewed as destabilizing

A. Option A: Government requests that petroleum consumers fill their tanks and implement a conservation program

1. Benefits

- Allows petroleum supplies to be dispersed as widely as possible

- Ensures petroleum supplies will be more available to users postattack

- Consistent with industry desire to rely on increased demand to spur increased supplies; hence industry should be more cooperative if this option is also being implemented

- No peacetime administration

- Can easily be implemented with one or more options under B below to better effect dispersal to tertiary storage

2. Cost

- Government planning needed to minimize potential problems due to surge in consumer demand causing

  - Gasoline lines
  - Fuel shortages

- Government coordination and dissemination to media of consumer information needed to implement the option

- Difficulty in recouping surviving postattack supplies to serve a "public good" rather than individual needs

B. Benefits and Cost of Actions Involving Industry

Option B(1): Government requests voluntary cooperation from industry to disperse petroleum products

1. Benefits

- Simple approach

  - No peacetime administration
  - Industry responsible for administration of action

- Of significant benefit if coupled with Option A; only marginal benefit of industry dispersing supplies to secondary storage alone because secondary storage capacity is a small percentage of national storage capacity

2. Cost

- Will increase secondary storage inventory carrying costs

- Increased industry transportation costs and fuel usage

- Reduces industry flexibility and control over nationwide petroleum distribution

- Estimated cost of action to industry: increase of approximately 20% in carrying and transportation costs for additional inventories

Option B(2): Government offers limited financial or logistical assistance to industry to disperse petroleum products.

1. Benefits

- No peacetime administration
- Industry may be more cooperative if government provides assistance
- Government assistance may help overcome limitations in industry resources; e.g., by supplementing industrial transportation fleet with vehicles claimed under the Defense Production Act

2. Cost

- Same negative aspects as under Option B(1); government assumes part of the financial or logistical burden on industry
- Government assistance would divert federal assets from other uses
  - Transportation assets that can be claimed quickly under the Defense Production Act may be limited
  - Funds would need to be appropriated by Congress
- Estimated cost of action to industry will vary, depending on level of government assistance
- Estimated cost to government will vary, depending on level of assistance provided

Option B(3): Government activates standby voluntary agreements between government and industry.

1. Benefits

- Ensures coordinated action
- Provides positive public relations potential for industry if it advertises the existence of such voluntary agreements
- A formal national program ensures that dispersal methods and secondary storage facilities will be known by both industry and government and prepared in advance

2. Cost

- Same negative aspects as under Option B(1)
- Estimated cost to government during negotiations on agreements
  - For negotiating one agreement: $25,000 (assumes 3 man months)
  - For total program negotiations: $500,000 (assumes 5 man years)
- Estimated cost of action to industry: increase of approximately 20% in carrying and transportation costs for additional inventories

Option B(4): Government activates standby agreements with industry which include limited financial or logistica. assistance.

1. Benefits

- Same potential benefits as Option B(3)
- Government may have more involvement in appropriate crisis distribution of petroleum
- Industry may be more cooperative if government provides assistance and/or incentives

2. Cost

- Same negative aspects as under Options B(1) and B (2); government assumes part of the financial and logistical burden on industry
- Government assistance would divert assets from other uses
  - Transportation assets that can be claimed quickly under the Defense Production Act may be limited
  - Funds would need to be appropriated by Congress
- Estimated cost tc government will vary, depending on level of assistance provided
- Estimated cost of action to industry will vary, depending on level of government assistance

Option B(5): Government orders industry to disperse petroleum products.

1. Benefits

- Makes dispersal of petroleum to secondary storage possible if industry is unwilling to cooperate by establishing clear penalties for failing to comply

2. Cost

- Would severely impair government/industry relations should the crisis pass
- Estimated cost of action to industry: increase of approximately 20% in carrying and transportation costs for additional inventories

V. IMPLEMENTATION PROCESS

For Option A and the five Option B alternatives of Section II above, the crisis period implementation process is:

A. Option A - Government requests that petroleum consumers fill their tanks and implement a conservation program

- A high administration official requests that consumers of petroleum products fill their products fill their tanks while also observing conservation measures
- The Department of Energy provides to the media information on the following topics which has previously been coordinated and prepared by the White House, the Federal Emergency Management Agency, and the Department of Energy
  - Types of petroleum products involved
  - The components of consumer storage covered by the government request (these are listed in Section I.A above)
  - The time limit goal of the government for filling consumer tanks (e.g., one week, two weeks)
  - Procedures for minimizing problems such as gasoline lines, petroleum shortages in some areas
  - Petroleum conservation measures

B. Actions Involving Industry

The implementation processes for industry options are described separately below.

1. Option B(1) - Government requests voluntary cooperation from industry to disperse petroleum products

- The Department of Energy, in coordination with the Federal Emergency Management Agency, contacts companies producing, distributing, and storing petroleum products
  - (If combined with Option A) Requests that petroleum refiners increase production (or, alternatively, begin shutdown procedures if an attack is believed to be imminent) and begin filling unusued primary storage in order to meet increase in consumer demand requested by President
  - Requests that secondary storage tanks be filled from primary storage and additional refinery production, if needed
  - Identifies types of petroleum products to be dispersed
  - Provides a time limit for filling secondary tanks and increasing production

- Companies move petroleum products along the primary and secondary distribution systems to fill secondary (and primary) petroleum storage; companies report progress to the Department of Energy

- The Federal Emergency Management Agency monitors progress of petroleum dispersal reported by the Department of Energy

2. Option B(2): Government offers limited financial or logistical assistance to industry to disperse petroleum products

- The Department of Energy, in coordination with the Federal Emergency Management Agency, contacts companies producing, distributing, and storing petroleum products
  - (If combined with Option A) Requests that petroleum refiners increase production (or, alternatively, begin shutdown procedures if an attack is believed to be imminent) and begin filling unusued primary storage in order to meet increase in consumer demand requested by President

- Requests that secondary storage tanks be filled from primary storage and additional refinery production, if needed
- Offers limited financial and/or logistical assistance to companies, as necessary, to secure their cooperation
- Identifies types of petroleum products to be dispersed
- Provides a time limit for filling secondary tanks and increasing production

- The Department of Energy sends request for supplemental funds to the Office of Management and Budget

- Companies move petroleum products along the primary and secondary distribution systems to fill secondary (and primary) petroleum storage; companies report progress to the Department of Energy

- The Federal Emergency Management Agency monitors progress of petroleum dispersal reported by the Department of Energy

- Companies submit requests for reimbursement to the Department of Energy

- The Department of Energy reimburses companies for their actions, as indicated when the request was made

3. Option B(3) - Government activates standby voluntary agreements between government and industry

- The Department of Energy, in coordination with the Federal Emergency Management Agency, informs petroleum companies with standby agreements to activate plan for crisis petroleum dispersal

- Companies move petroleum products along the primary and secondary distribution systems to fill secondary (and, if combined with Option A above, primary) petroleum storage; companies report progress to the Department of Energy

- The Federal Emergency Management Agency monitors progress of petroleum dispersal reported by the Department of Energy

4. Option B(4) - Government activates standby agreements with industry which include limited financial or logistical assistance

- The Department of Energy, in coordination with the Federal Emergency Management Agency, informs petroleum companies with standby agreements to activate plan for crisis petroleum dispersal

- The Department of Energy notifies the Office of Management and Budget of intention to draw on emergency funds

- Companies move petroleum products along the primary and secondary distribution systems to fill secondary (and, if combined with Option A above, primary) petroleum storage; companies report progress to the Department of Energy

- The Federal Emergency Management Agency monitors progress of petroleum dispersal reported by the Department of Energy

- Petroleum companies submit requests for reimbursement to the Department of Energy

- The Department of Energy reimburses companies for their actions, in accordance with financial assistance agreements

5. Option B(5) - Government orders industry to disperse petroleum products

- The President activates Section 101(b) of the Defense Production Act for petroleum products

- The Department of Energy, in coordination with the Federal Emergency Management Agency, contacts companies producing, distributing, and storing petroleum products

  - (If combined with Option A) Directs that petroleum refiners increase production (or, alternatively, begin shutdown procedures if an attack is believed to be imminent) and begin filling unused primary storage in order to meet increase in consumer demand requested by President
  - Directs that secondary storage tanks be filled from primary storage and additional refinery production, if needed
  - Identifies types of petroleum products to be dispersed
  - Provides a time limit for filling secondary tanks and increasing production

- Companies move petroleum products along primary and secondary (and, if combined with Option A, primary) petroleum storage; companies report progress to the Department of Energy

- The Federal Emergency Management Agency monitors progress of petroleum dispersal reported to the Department of Energy

Section VI below provides additional material related to the above options for crisis dispersal of petroleum products

VI. SUPPORTING MATERIAL

A. Industry views on feasibility of crisis dispersal

- Industry is strongly opposed to all actions involving crisis dispersal of petroleum products
  - Prefers the market mechanism to move petroleum products
  - Some believe products are already adequately dispersed
  - There are not large primary storage inventories of petroleum products that can be dispersed to secondary or tertiary storage without causing operational problems in the systems distributing products held in primary storage
  - Primary/secondary distribution methods already being utilized efficiently; little extra capacity available for rapid crisis dispersal
  - Hoarding will occur
  - Transportation fuels should be conserved, not used up in crisis dispersal
  - Unused secondary/tertiary storage is not in high-demand areas or along central distribution points, and so filling this unused capacity would not immediately benefit postattack survivors
  - Industry representatives have stated that, in discussions between industry and the Department of Defense, agreement was reached that crisis dispersal of petroleum products is not a reasonable method of assuring postattack product supplies
- Industry's position is that the best methods of assuring postattack supplies of critical petroleum products are:
  - Reducing the vulnerability of refineries
  - Reducing the vulnerability of the strategic petroleum reserve (SPR)
  - Increasing SPR supplies
- Industry would nevertheless probably cooperate with crisis dispersal as long as
  - End user demand increased
  - Tertiary storage is available for increased supplies (largely true now; see Figure 4)
  - Primary storage quantities do not drop below minimum levels needed to operate petroleum distribution systems

B. Items to be negotiated in government-industry standby agreements (Options B(3) and B(4))

- Identification of critical petroleum products to be dispersed

- Identification of high risk storage facilities from which petroleum should be moved during a crisis

- Identification of lower risk storage capable of holding products designated as high risk

- Industry reporting to government on progress of dispersal

- Methods of dispersal

  - Pipelines
  - Tankers
  - Barges
  - Tank cars
  - Trucks

- Timetable/time limit for filling secondary product storage

  - Time limit or phased timetable

- Industry responsibility during transattack and postattack

- Additional items to be negotiated only for Option B(4) (limited financial or logistical assistance)

  - Government role in providing
    -- Additional transportation assets
    -- Personnel
    -- Additional storage areas
    -- Reimbursements
    -- Tax incentives
    -- Security

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D. Companies, Agencies, and Individuals Contacted

COMPANIES/AGENCIES	INDIVIDUALS
American Petroleum Institute	Betty Anthony
Defense Fuel Supply Center	Don Peters
Department of Energy	Bob Pressley, Brian Woodward
Exxon USA	D.L. McLallen
Federal Emergency Management Agency	Melissa Howard
Mobil Oil	Robert Boeke
National Petroleum Council	Andy Oliver
Petroleum Marketers Association of America	Carol Poos, Phil Chisholm
Shell Oil	Edward Olmo
U.S. Senate Committee on Energy and Natural Resources	Ann Loomis

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TECHNICAL DATA FOR MEA PAPER:

CRISIS DISPERSAL OF TRANSPORTATION ASSETS

D

DECEMBER 1986

TITAN SYSTEMS, INC.
1950 GALLOWS ROAD
VIENNA, VA 22180

TABLE OF CONTENTS

CRISIS DISPERSAL OF TRANSPORTATION ASSETS

I. PURPOSE OF ACTION

The purpose of this action is to assist in the pre-attack crisis dispersal of transportation personnel and supplies and to enhance the availability of transportation assets in the postattack through coordination between industry and government in the movement of such assets to lower risk areas during a crisis.

This action could cover either transport vehicles on the ground or in port which are not in transit, or in-transit vehicles, or both, depending on the desired scope of action. Vehicles not in transit which are needed for postattack recovery would be moved out of designated high risk areas, and in-transit vehicles would be diverted from such areas.

A. Reasons for crisis dispersal of transportation assets are as follows:

- Would further enable the transportation industry to assist in crisis relocation of personnel and supplies critical to other resource capabilities
- Would limit the destruction of vehicles needed to aid survivors and assist in postattack recovery and resumption of transport service
- Would reduce dependence on vulnerable portions of transportation manufacturing in the immediate postattack
- Would reduce needed transportation equipment repair in the immediate postattack

B. The five major modes of commercial transportation covered by this action are the following:

- Railroad freight
- Motor freight (trucking companies)
- Surface passenger
  - Buses
  - Local commuter trains
  - AMTRAK
- Commercial air carriers
- Commercial shipping
  - Inland waterway
  - Ocean
  - Great Lakes

II. ALTERNATIVE LEVELS OF IMPLEMENTATION

Five levels of implementation are described in this section. Each represents a separate option to implement crisis relocation of transportation assets to lower risk areas. The five levels are:

Option A: Government requests voluntary cooperation from the transportation industry to disperse vehicles to lower risk areas.

Option B: Government offers limited financial or logistical assistance to the transportation industry to disperse vehicles to lower risk areas.

Option C: Government activates standby voluntary agreements between government and the transportation industry to disperse vehicles to lower risk areas.

Option D: Government activates standby agreements with industry, which include limited financial or logistical assistance, to disperse vehicles to lower risk areas.

Option E: Government orders the transportation industry to disperse vehicles to lower risk areas.

Implementation of the above options would only occur in the event of a crisis. All options require some preparatory activities. A major decision factor in implementing any of these options is the high visibility of movement of large numbers of transportation assets. Further elaboration is provided below.

A. Option A: Government requests voluntary cooperation from the transportation industry to disperse vehicles to lower risk areas.

- No cost to government
- Industry bears cost
- Prior government/industry coordination desirable to identify
  - Types of vehicles to be moved
  - High risk areas from which vehicles are to be moved
  - Designated low risk areas
  - Clarification of possible conflicting industry roles in (a) relocating vehicles to low risk areas and (b) providing vehicles to meet the needs of a crisis mobilization during a declared national emergency
- May require declaration of national emergency to help motivate industry compliance; some existing mobilization programs can only be activated under a declared national emergency

- Government provides to industry a timetable for movement of vehicles

- Industry responsible for:

  - Movement of vehicles
  - Providing fuel needed to move vehicles
  - Security
  - Reporting progress of movement to government
  - Providing essential personnel

- Vehicles remain under the ownership and management of industry

B. Option B: Government offers limited financial or logistical assistance to the transportation industry to disperse vehicles to lower risk areas.

- Prior government/industry coordination desirable, as indicated for Option A above

- May require declaration of national emergency to help motivate industrial compliance and to obtain congressional approval to fund industry reimbursement; some existing programs can only be activated under a declared national emergency

- Government provides to industry a timetable for movement of vehicles

- Government provides financial or logistical assistance for one or more of the following on an ad hoc basis:

  - Reimbursement for loss of business due to interruption of operations
  - Movement of additional people and supplies during crisis relocation
  - Fuel needed to move vehicles
  - Personnel needed to move vehicles
  - Security

C. Option C: Government activates standby voluntary agreements between government and the transportation industry to disperse vehicles to lower risk areas.

- During peacetime, government negotiates voluntary agreements with the transportation industry; Section VI, Supporting Material, lists items to be negotiated in agreements

- Government notifies the transportation industry to activate plan for crisis relocation of transportation assets

- Implementation details determined in advance on company by company basis with industry association involvement

- Industry may prefer that government declare a national emergency as a prerequisite to activating voluntary agreements

- Industry vehicles remain under the ownership and management of industry

- No cost to government after negotiations of standby agreements

- Industry bears cost

D. Option D: Government activates standby agreements with industry, which include limited financial or logistical assistance, to disperse vehicles to lower risk areas.

- During peacetime, government negotiates voluntary agreements with transportation industry; Section VI, Supporting Material, lists items to be negotiated in agreements

- Government notifies transportation industry to activate plan for crisis relocation of transportation assets

- Implementation details determined in advance on a company by company basis with industry association involvement

- Industry may prefer that government declare a national emergency as a prerequisite to activating voluntary agreements

- Industry vehicles remain under the ownership and management of industry

- Government provides financial or logistical assistance for one or more of the items listed under Option B above.

E. Option E: Government orders the transportation industry to disperse vehicles to lower risk areas.

- Government provides industry with a complete and precise set of vehicle relocation instructions

- Strong government direction may be needed; many new transport carriers, since the advent of transportation deregulation, are not familiar with obligations they would incur during a mobilization

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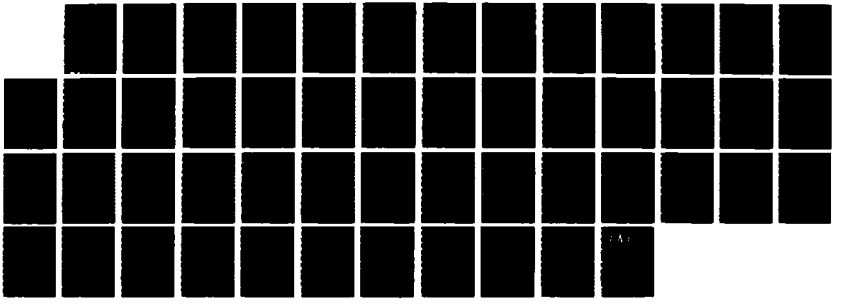

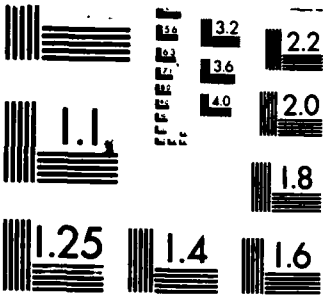

III. AUTHORITIES

A. Defense Production Act of 1950, as amended

- Sec. 101(a) (50 U.S.C. app. 2071(a)) - requires the priority performance of contracts and orders in support of approved programs and permits the allocation of resources and facilities to promote the national defense
- Sec. 101(b) (50 U.S.C. 2071(b)) - authorizes the government to control the distribution of resources in the civilian market when a material is "scarce, critical, and essential to national defense"
- Title III, as amended 1984 (50 U.S.C. app. 2091, et. seq.) - authorizes the government to provide financial incentives to expedite productive capacity and supply
- Sec 708 - delegates Presidential authority to consult with industry in order to enter into voluntary agreements with industry

B. 49 U.S.C. Transportation

- Sec. 301 - assigns the Secretary of Transportation primary authority to coordinate the crisis mobilization of transportation resources
- Sec. 11128 - states authority of the Interstate Commerce Commission to control surface carriers under conditions of a threatened war

C. EO 10480 - Administration of Defense Mobilization Program

- Sec. 101 - assigns FEMA the authority to coordinate mobilization activities relating to transport
- Part III - defines agency responsibilities in providing private sector financial incentives
- Sec. 501 - grants authority to DOT to enter into agreements with industry; delegates President's authority to consult with industry to FEMA and delegates authority to OMB to develop guidelines and procedures for the establishment of advisory committees to assist with agreements

D. EO 11490 - Assignment of Emergency Preparedness Functions to Federal Departments and Agencies

- Part 4 - assigns Department of Commerce responsibilities pursuant to the Defense Production Act of 1950, EO 10480, and the Defense Mobilization Orders
- Part 11 - assigns Department of Justice responsibility to provide consultation in approving voluntary agreements between government and industry
- Part 14 - assigns Department of Transportation responsibilities for emergency transportation planning and programs
- Part 22 - assigns Federal Emergency Management Agency responsibilities for coordination of all emergency preparedness activities of the federal government
- Part 25 - assigns Interstate Commerce Commission responsibilities to prepare emergency plans and programs to reduce the vulnerability of domestic surface transportation as well as to develop and maintain orders for the operation of domestic surface transportation in an emergency

E. 15 CFR Series

- No. 350 - Defense Priorities and Allocation System (DPAS) - A Department of Commerce regulation which provides a framework within the Department of Commerce for rapid industrial mobilization in a national emergency

F. 44 CFR Series

- No. 323 - Defense Mobilization Order 4 - provides guidance on priority use of resources in the immediate postattack period
- No. 332.2 - provides interagency policy guidelines for development, approval, and implementation of voluntary agreements

G. 46 CFR Series

- No. 345 - places restrictions on the use of port facilities in a national emergency

H. Interstate Commerce Commission General Transport Mobilization Orders - provides for the control of specified rail, freight, passenger, and water carrier service upon declaration of a national emergency

I. FPC-7 - provides general guidance for resource management in national emergencies

IV. EXPECTED BENEFITS AND COST

A. General

Moving transportation assets away from high risk areas increases the likelihood that a large number of vehicles will survive an attack. The survival and postattack availability of transportation vehicles will have a direct impact on the nation's ability to utilize all surviving resources, even if transportation is not near surviving populations. Examples of critical postattack transportation needs include:

- Moving food to the surviving population
- Providing fuel to survivors and industry
- Moving needed drugs to the injured and medical personnel
- Movement of military personnel and equipment
- Providing spare parts and materials to damaged facilities for repair and reconstruction
- Providing raw materials to manufacturers of critical items
- Providing critical products to consumers

In addition to moving transportation vehicles out of high risk areas during a crisis, it is also important that other related assets important to the operation of the transportation industry be made less vulnerable as well. These related assets include personnel, fuel, and essential warehoused items such as spare parts and tires. Relocated vehicles can be used during the crisis to transport people and critical supplies. They can also be used as emergency warehouses for survival and recovery materials and supplies.

General costs or negative aspects of relocating commercial transportation vehicles during a crisis could include the following:

- Loss of industry business and profit due to interruption of operations
- Relocation of vehicles will add to consumption of fuel which would need to be conserved
- Difficulties in obtaining adequate fuel to move vehicles
- Availability of personnel needed to move vehicles quickly
- Vehicle relocation may increase congestion of transportation routes and arteries

- Vehicle relocation may result in:
  - Increased difficulty in making vehicles available to the military during crisis mobilization
  - Increased difficulty in upholding industrial obligations under the Defense Production Act
  - Possible violation of standby orders restricting the movement of transportation vehicles during a declared national emergency, such as
    -- ICC Transportation Mobilization Orders
    -- Grounding of civil aircraft in a national emergency
    -- Restrictions on the movement of ocean freight and the use of port facilities during an emergency
- Hardship on families of personnel used to relocate assets

B. Specific

Option A: Government requests voluntary cooperation from the transportation industry to disperse vehicles to lower risk areas.

1. Benefits

- Simple approach
  - No peacetime administration
  - Industry responsible for administration of action
- Consistent with stated desires of some portions of the industry, e.g., railroads, to develop emergency preparedness plans on their own
- Consistent with deregulation of major portions of the industry, e.g., trucking
- Minimizes potential conflict with industry obedience to ICC standby orders, the Defense Production Act, and military requests for vehicles

2. Cost

- Cost of fuel to relocate vehicles
- Possible interruption of business due to reduced availability of vehicles
- Cost of hiring additional personnel to relocate vehicles
- Cost of space to park vehicles if on private property

Option B: Government offers limited financial or logistical assistance to the transportation industry to disperse vehicles to lower risk areas.

1. Benefits

- Government assistance may help overcome limited industry resources, such as
  - Personnel to move vehicles
  - Available fuel
  - Money to pay for needed additional fuel and personnel
  - Security

- Industry may be more cooperative if government provides assistance

2. Cost

- Acceptance of government assistance may induce carriers to neglect other crisis mobilization obligations pertaining to the use of vehicles, such as:

  - The Defense Production Act (DPA)
  - The Contingency Response (CORE) program of the Military Traffic Management Command (MTMC)
  - The Civil Reserve Air Fleet (CRAF) program
  - Interstate Commerce Commission (ICC) General Transport Mobilization Orders

- The costs of Option A above still exist; the government compensates industry for portions of the cost as part of Option B

Option C: Government activates standby voluntary agreements between government and the transportation industry to disperse vehicles to lower risk areas.

1. Benefits

- Existence of standby agreements may reduce the risk that industry will fail to uphold crisis mobilization obligations to the military as well as those stemming from the Defense Production Act

- Provides the government with a better idea of which parts of the industry can be expected to cooperate in the event of a crisis

- Provides strong assurance that commercial transportation assets which are not needed by the military during a crisis will be diverted from high risk areas

- Helps ensure that both industry and government will know where assets will be held in the event of an attack

2. Cost

- The costs of Option A hold for Option C as well

Option D: Government activates standby agreements with industry, which include limited financial or logistical assistance, to disperse vehicles to lower risk areas.

1. Benefits

- The benefits of this option are a combination of those for Options B and C

2. Cost

- The costs of Option A above still exist; government compensates industry for portions of these costs as part of Option D

Option E: Government orders the transportation industry to disperse vehicles to lower risk areas.

1. Benefits

- Provides some assurance that assets which are not needed by the military during a crisis will survive an attack, especially since transportation deregulation has had an impact on industry willingness and ability to cooperate voluntarily

2. Cost

- Would severely impair government/industry relations should the crisis pass

- Costs of Option A still apply

V. IMPLEMENTATION PROCESS

For the five options, the crisis period implementation process is:

A. Option A: Government requests voluntary cooperation from the transportation industry to disperse vehicles to lower risk areas.

- The Department of Transportation, in coordination with the Department of Defense, the Interstate Commerce Commission, and state and local governments, contacts commercial transportation companies
  - Requests that transportation vehicles, and other assets needed for their continued operations (personnel, fuel, spare parts), that are not currently being used to carry out priority contracts under the Defense Production Act or the military be relocated within low risk areas
  - Identifies types of vehicles to be relocated
  - Identifies high risk areas away from which transport vehicles should be moved
  - Identifies low risk areas to which vehicles should be moved
  - Provides a time limit for moving assets
- Transportation companies move assets away from designated high risk areas; companies report progress to state or local government or to the Department of Transportation Regional Office of Emergency Transportation
- The Federal Emergency Management Agency monitors the progress of transportation relocation reported by the Department of Transportation

B. Option B: Government offers limited financial or logistical assistance to the transportation industry to disperse vehicles to lower risk areas

Each of the implementation steps of Option A above hold for Option B as well. Additionally, the following apply:

- The Department of Transportation, in coordination with state governments
  - Offers limited financial and/or logistical assistance to companies, as necessary, to secure their cooperation
- The Department of Transportation sends requests for supplemental funds to the Office of Management and Budget

- Companies submit requests for reimbursement to the Department of Transportation or state governments, as applicable

- The Department of Transportation or state governments reimburse companies for their actions, as agreed when the request was made

C. Option C: Government activates standby voluntary agreements between government and the transportation industry to disperse vehicles to lower risk areas.

- The Department of Transportation, in coordination with the Department of Defense, the Interstate Commerce Commission and state and local governments, informs transportation companies with standby agreements to activate the plan for relocation of assets to low risk areas

- Companies move assets away from designated high risk areas; companies report progress to state or local government or to the Department of Transportation Regional Office of Emergency Transportation

- The Federal Emergency Management Agency monitors progress of asset relocation reported by the Department of Transportation

D. Option D: Government activates standby agreements with industry, which include limited financial or logistical assistance, to disperse vehicles to lower risk areas

The steps of this option consist of the combined steps of Options B and C.

E. Option E: Government orders the transportation industry to disperse vehicles to lower risk areas

- The Secretary of Transportation orders the relocation of transportation vehicles away from high risk areas upon declaration of a national emergency; the Secretary further:

  - Identifies the types of vehicles and other assets to be moved or diverted
  - Identifies high risk areas away from which assets are to be moved
  - Provides a time limit for movement of assets
  - Stipulates under what conditions designated vehicles do not fall under this order, e.g., those vehicles already claimed to fulfill priority contracts of the Defense Production Act or military needs

- Identifies procedures which companies are to follow in reporting to the government the progress of asset relocation

- Companies move assets away from designated high risk areas; companies report progress to the government as indicated by the Secretary of Transportation

- The Federal Emergency Management Agency monitors the progress of transportation relocation reported by the Department of Transportation

VI. SUPPORTING MATERIAL

A. Industry Views

- Diversion of in-transit vehicles to low risk areas during a declared emergency is an idea widely accepted by industry. ICC Transport Mobilization Orders, which embody this concept, were formulated in consultation with industry representatives.

- Relocation of stationary vehicles out of high risk areas is controversial. The railroad industry is perhaps more receptive to the idea since there are only two domestic locomotive manufacturing plants.

- Some railroad companies have plans to move locomotives into tunnels in the event of an emergency.

- The trucking industry believes it is adequately dispersed.

- The airlines have safety airfields to which they can redirect their planes in the event of an emergency. The airfields were selected by the airlines and coordinated with the Department of Defense. No comparable plan exists for trucks, ships, or railways.

- The shipping industry will look to the military (the Military Sealift Command, working closely with the Maritime Administration) for direction in the event of a national emergency if military cargo is being transported. If commercial cargo is being carried exclusively, movement will be completed unless directions to the contrary are received from the military. The shipping industry has no plans to move ships away from ports just to reduce their vulnerability in the event of an emergency.

- Except for aircraft, other types transportation vehicles are relatively slow; relocation of such assets is of little use on short notice.

- State Emergency Transportation Boards existed from 1962 until 1973 when they ceased to exist due to funding cuts. They consisted of:

  - A high-level state official
  - A representative of the trucking industry
  - An ICC field agent representative
  - A bus association agency representative
  - A state emergency officer

  The ICC has recently drafted a plan to resurrect these boards in each state. The ICC plan recommends that carriers develop crisis contingency plans under direction from FEMA. The trucking industry has not cooperated in this effort since its deregulation in 1981.

- The National Defense Transportation Association (NDTA) is comprised of retired military officers and commercial carrier rep. esentatives. It is not associated with DOT and was begun 44 years ago. NDTA spends little or no time drafting emergency preparedness plans, but NDTA officials are beginning to work with state and local government officials to try to prepare emergency transportation plans.

  NDTA officials state that they have received minimal co-operation from FEMA. Some years ago, they claim that NDTA tried to become involved with FEMA on coordinating emergency transportation objectives, but received little cooperation from FEMA. The national NDTA headquarters thus has ceased drafting emergency preparedness plans. However, a few local NDTA chapters have managed to develop such plans. Examples are the Seattle and San Francisco chapters. Other chapters are trying to adapt this work, including the Washington, D.C., area chapter.

B. Items to be negotiated in government-industry standby agreements (Options C and D):

- High risk areas from which vehicles are to be moved
- Types of vehicles to be relocated or diverted
- Low risk areas to which vehicles will be relocated or diverted
- Industry relocation responsibilities vis a vis possibly competing crisis obligations, such as:

  - Military requests for vehicles
  - Claimancy requests made under the Defense Production Act

- Timetable or time limit for relocation of vehicles

- Method of reporting progress of vehicle relocation to the government

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  - Title 32A-National Defense Appendix. Chapter VIII. General Transport Mobilization Orders. Undated.

D. Companies, Agencies, and Individuals Contacted

COMPANIES/AGENCIES	INDIVIDUALS
American Trucking Association	Edward Ryder
Consolidated Freightways	Gene West
Department of Transportation	George Barry
Interstate Commerce Commission	Paul Graham
Maritime Administration	Frank Case
Military Traffic Management Command	Colonel Scarboro
National Defense Transportation Association	Lee Venzke
a. Greyhound	Joe Bellino
b. Prudential Lines (ocean shipping)	Joseph Torsani
Virginia Department of Emergency Services	Basil Keyes
Yellow Freight System	Newton Graves

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

TECHNICAL DATA FOR MEA PAPER:

PEACETIME EMP MITIGATION OF PETROLEUM FACILITIES

DECEMBER 1986

E

TITAN SYSTEMS, INC.
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ACTION: PEACETIME EMP MITIGATION AT PETROLEUM FACILITIES

I. PURPOSE OF ACTION

A. The purpose of this action is to improve the probability that petroleum facilities would be able to withstand the effects of electromagnetic pulse (EMP) by having the petroleum industry harden electronic components in its facilities or, at a minimum, implement EMP mitigation procedures.

B. Due to current political realities, this document assumes that no government funds would be available to cover the cost of EMP mitigation. Therefore, this action entails attempting to interest the petroleum industry in voluntarily implementing EMP mitigation at its facilities.

C. The types of equipment which are vulnerable in petroleum facilities are illustrated in Table 1.

II. REASONS FOR ACTION

- Electronic equipment, which is vulnerable to the effects of EMP, is becoming increasingly important to the petroleum production, processing, and distribution chain (see Table 1). Vulnerable areas include:

  - Computer controls
  - Management tools
  - Communications
  - Electrical power

- Refineries are highly dependent on computers for process control optimization. Examples are:

  - Product mix
  - Product quality
  - Product quantity

- Pipelines are dependent on computers for:

  - Batch tracking
  - Storage capacity
  - Transport capacity
  - Safety

- Some routine safety measures in effect increase EMP vulnerability, i.e., single point grounding provides an antenna structure for EMP coupling

TABLE 1

EMP VULNERABILITY AT PETROLEUM FACILITIES

VULNERABILITY/ DEPENDENCE	WELLHEADS	REFINERIES	DISTRIBUTION*
Direct Vulnerability	Motors, pumps, sensors, controls	Process control (temperature, pressure, chemical composition, etc.), sensors, CPUs, peripherals, valve actuators	Flow sensors, valve position sensors, actuators, motor control, CPUs, inventory control (batch tracking, storage capacity, transport capacity),
Indirect Vulnerability	Electric power, transport, communications	Electric power, transport, communications	Electric power, communications
Computer Dependence Level	Low dependence	High dependence	Crude: low dependence Refined: moderate dependence

*Ships, pipelines, trucks

SOURCE: IRT Corporation, EMP Effects on Industrial War/Support Capacity. DNA-TR-84-436, December 1984.

- The high voltage caused by EMP can cause fire and explosions at plants.

III. ALTERNATIVE LEVELS OF IMPLEMENTATION

A. General

Four levels of implementation are presented in this section. Each represents a different option for reducing the vulnerability of the petroleum industry to the effects of EMP. The four levels are:

Option A: Government requests selected petroleum companies to implement peacetime EMP mitigation procedures and to develop plans for implementation of crisis EMP mitigation procedures at selected facilities.

Option B: Government requests selected petroleum companies to EMP harden external power and communication lines at selected facilities.

Option C: Government requests selected petroleum companies to EMP harden selected facilities.

Option D: Government requests all petroleum companies to EMP harden all facilities.

B. Government Role

The four options are listed in order of increasing levels of EMP hardening across the industry. The type of government involvement remains relatively constant through all the options and includes the following:

- Provide guidelines on EMP mitigation procedures or EMP hardening
- Provide technical assistance during implementation of procedures
- Provide training for industry technicians
- Inspect facilities to ensure integrity of EMP mitigation procedures or hardening - i.e., that changes in equipment configuration haven't degraded the quality of the EMP hardening

C. Industry Role

Industry's involvement also remains relatively constant through all the options and includes the following:

- Development of facility-specific plans and procedures

- Implementation of procedures

- Cost of

  - Technicians
  - EMP hardened parts
  - EMP protective equipment/parts
  - Maintenance

D. Description of Options

The difference between the options, thus, can be described according to the EMP mitigation approach.

Option A: Government requests selected petroleum companies to implement peacetime EMP mitigation procedures and to develop plans for implementation of crisis EMP mitigation procedures at selected facilities.

- The objective of this option would be:

  - To provide a minimum of protection to facilities so that enough equipment will survive to facilitate reconstitution; this option would not protect facilities sufficiently to ensure immediate postattack operation
  - To provide a lower cost alternative to EMP hardening

- Peacetime mitigation procedures could include:

  - Zoning of equipment to provide for shorter communication lines
  - Disconnecting all power and communications lines automatically when not in use
  - Storage of spare parts and equipment in metal (or shielded) enclosures
  - As components are replaced or system upgrades occur, replace parts with only EMP hardened components

- Crisis mitigation procedures could include:

  - Shutting down plants
  - Disconnecting equipment

Option B: Government requests selected petroleum companies to EMP harden external power and communication lines at selected facilities.

- The objective of this option would be:

- To harden facilities against EMP effects via external lines which under certain conditions could be the major conductors of surge voltage from EMP into facilities
- To enhance the probability that enough equipment will survive to facilitate reconstitution
- To provide a lower cost alternative to complete EMP hardening

- EMP hardening would include:

  - Installation of metal oxide varistors at power sources
  - Installation of plug-in protectors on unused power outlets
  - Installation of low-rf-impedence counterpoise at facility entry point of long external conductor runs

Option C: Government requests selected petroleum companies to EMP harden selected facilities.

- The objective of this option would be:

  - To increase the probability that some facilities could survive EMP and be operational immediately postattack
  - To make an EMP hardening program manageable by carefully selecting the facilities to be hardened to optimize potential petroleum product output postattack

- EMP hardening would include:

  - Shielding equipment in metal enclosures
  - Installation of terminal protection devices including:
    -- Gas, zener, and silicon (biased) diodes
    -- Thyrite and metal oxide varistors
    -- Limiter-filter combinations
    -- Crowbar circuits
    -- Filters
    -- Inductive devices
    -- Spark gaps
  - Hardening of external power and communications lines as described for Option B

Option D: Government requests all petroleum companies to EMP harden all facilities.

- The objective of this option would be to provide maximum industry protection

- All petroleum facilities nationwide would be candidates for EMP hardening

- Hardening techniques would be the same as those listed for Option C

IV. IMPLEMENTATION PROCESS

General

- Before approaching industry, issues which the government needs to address include:
  - The probability of enough petroleum products surviving in the immediate postattack to supply survivor needs until facilities could be repaired
  - Whether there are enough facilities which could function without electronic controls, if necessary
  - Whether operable facilities postattack would have access to the following vital supplies, without which they probably would not be able to function:
    - -- Water
    - -- Transportation
    - -- Electricity
    - -- Communications
  - What electronic equipment at each type of facility is essential for proper operation (see Table 1 for general list)
  - Which facilities need to be EMP hardened
    - -- Wellheads
    - -- Refineries
    - -- Bulk plants and terminals
    - -- Transportation assets
      - oo Ships
      - oo Trucks
      - oo Pipeline pumping stations
  - Whether control system manufacturers should be approached regarding EMP mitigation in addition to (or instead of) petroleum corporations
  - Whether there are new facilities being built which could be hardened during construction
  - Develop and test industry-specific EMP hardening techniques
    - -- To date EMP hardening has been designed for communications and military facilities, direct application of these techniques to petroleum facilities may not be appropriate
    - -- Testing of industry-specific EMP hardening techniques is currently being performed for the electric power industry under a DOE program; this program should be studied as a model for a comparable program relating to the petroleum industry
  - Which government agency should be responsible for the program
    - -- FEMA
    - -- DOE

- Development of appeal to industry:
  - Government needs to educate industry as to the indirect dangers of EMP effects as opposed to blast, fire, and other direct destructive nuclear effects
  - Government needs to emphasize added benefits of EMP hardening:
    -- Lightning protection
    -- Protection from external power surges
  - Government needs to determine what incentives might persuade industry to cooperate
    -- Tax deductions
    -- Provision of information useful to industry
- For Options A, B, C (government approaches selected petroleum companies):
  - Government needs to determine which petroleum companies to approach based on:
    -- Location of facilities
    -- Percentage of industry output
    -- In-place corporate preparedness program
- Development of guidelines:
  - Generic guidelines need to be developed for:
    -- EMP mitigation procedures
    -- EMP hardening techniques
  - Guidelines may need to be modified or made facility-specific depending upon the options
- Development of training materials:
  - For government employees who will provide technical assistance to industry
  - For industry technicians*
    -- EMP mitigation procedures
    -- EMP hardening techniques
    -- Maintenance of integrity of EMP mitigation

*NOTE: Technicians include both employees of petroleum corporations as well as employees of manufacturers of electronic systems which are installed in petroleum facilities.

Options A through C:

The implementation process for Options A through C are essentially the same with the exception of the subject matter which would be:

Option A - EMP mitigation procedures

Option B - EMP hardening of external power lines and communication lines

Option C - Complete facility EMP hardening

The implementation process for these options would be as follows:

- DOE contacts the American Petroleum Institute (API) to enlist its support in appealing to pre-selected corporations to participate in EMP mitigation or hardening program

- DOE contacts upper managment at pre-selected corporations and requests that they EMP harden or implement EMP mitigation procedures at their facilities

  - Discuss value of the mitigation or hardening approach
  - Provide company with generic guidelines and request that they write facility-specific procedures

- FEMA's Emergency Management Institute or a DOE laboratory offers training

  - To emergency managers for writing procedures and managing mitigation program
  - To technicans on implementation of EMP mitigation procedures or installation of EMP hardening devices
  - To technicians on maintaining integrity of hardening

- DOE and/or FEMA review facility-specific procedures for accuracy and completeness

- DOE and/or FEMA inspect facilities for integrity of EMP hardening or mitigation systems

Option D: Government requests all petroleum companies to EMP harden all facilities.

- DOE contacts the American Petroleum Institute (API) to arrange seminars in FEMA regions for petroleum companies

- In seminar, DOE:

  - Discusses advantages to industry of EMP hardening
  - Describes what would be involved in hardening facilities
  - Requests petroleum companies to EMP harden their facilities

- After seminar, FEMA regional offices or DOE follow-up with each corporation:
  - To provide corporations with generic guidelines on EMP hardening
  - To request corporations to write industry-specific procedures
- FEMA's Emergency Management Institute or a DOE laboratory offers regional training sessions
  - To emergency managers for writing facility-specific EMP hardening procedures
  - To technicians on installation of EMP hardening devices
  - To technicians for maintenance of EMP hardening
- DOE and/or FEMA review facility-specific procedures for accuracy and completeness
- DOE and/or FEMA inspect facilities for integrity of EMP hardening

V. EXPECTED BENEFITS AND COSTS

General

- Benefits of EMP mitigation at petroleum facilities
  - Improves the survivability of petroleum production, processing, and distribution capabilities
  - Enhances the possibility that the petroleum corporations would be able to support a war effort
  - Enhances the possibility for survivors to have needed fuel postattack
  - Enhances the possibility that industry would have needed fuel postattack to begin national recovery efforts
- Difficulty in providing cost estimates
  - Industry-specific techniques have not yet been developed
  - Size and design of facilities may vary substantially
- Negative impact of EMP mitigation of petroleum facilities
  - If only some companies harden some facilities, those who don't will enjoy lower operating costs
  - Additional cost will make domestic petroleum less competitive with imported petroleum
  - Political problems associated with perception of wartime mobilization

Option A: Government requests selected petroleum companies to implement peacetime EMP mitigation procedures and to develop plans for implementation of crisis EMP mitigation procedures at selected facilities.

- Benefits:
  - Because less expensive than EMP hardening, industry may be more cooperative
  - Improves EMP mitigation in the long run
  - By creating a demand for manufacturers to produce EMP hardened parts on a large scale, may bring down the cost of EMP hardened parts
- Advantages:
  - Improves survivability of equipment from the effects of EMP, thus may reduce postattack recovery time
  - Should cost less and be less cumbersome to implement than EMP hardening
  - Lower public visibility than EMP hardening could minimize negative public opinion problem
- Disadvantages:
  - Although many components will be more survivable, it is unlikely that facilities will be operational immediately postattack; major repairs may still be necessary
  - Reconfiguration of plants to rezone equipment may be as disruptive as hardening would be
- Cost to industry:
  - Developing facility-specific EMP mitigation procedures: will vary by facility but should be less expensive than Option C and D
  - Implementation of EMP mitigation procedures: will vary by facility but should be less expensive than Option C and D
  - Off-the-shelf EMP hardened parts: adds 10-15% to cost of parts
- Elements of cost to government:
  - Development of overall program
  - Appeal to companies for participation
  - Development of generic mitigation techniques
  - Development of generic guidelines
  - Training program:
    - -- For government employees
    - -- For industry technicians

Option B: Government requests selected petroleum companies to EMP harden external power and communication lines at selected facilities.

- Benefits:
  - Minimizes EMP effect on equipment inside the facility caused by high voltages and currents conducted into the building via long lines
  - Less expensive than complete hardening of facilities
- The disadvantage is that there is no protection against EMP effects via long lines inside facilities
- Cost to industry:
  - Protection devices
    -- Cost per part is minimal
    -- Quantity of parts will vary by facility
  - Development of facility-specific hardening procedures: will vary by facility but will be moderate compared to Options C and D
  - Labor costs for hardening will vary by facility but will be moderate compared to Options C and D
- Elements of cost to government - same as for Option A

Options C and D: Government requests selected or all petroleum companies to EMP harden facilities.

- Benefits:
  - Maximum possible survivability from EMP effects
  - For Option C, careful selection of facilities can enhance the possibility of adequate supplies of different petroleum distillates
  - For Option D, possibility of larger number of facilities surviving
- Disadvantages:
  - Retrofitting equipment with protective devices could be very disruptive and expensive
  - For Option D, an industry-wide program would be:
    -- Difficult to coordinate
    -- Difficult to acquire industry-wide cooperation
- Cost to industry
  - Protection devices
    -- Most parts cost under $10.00 each with diodes as low as $.40 each
    -- Spark gaps cost between $100.00 and $150.00 but may not be needed in this application

-- Quantity of parts will vary by facility but large quantities will be needed in general
- Development of facility-specific hardening procedures: will vary by facility
- Labor costs for hardening will vary by facility

- Elements of cost to government - same for all options except for cost of seminars in Option D

VI. AUTHORITIES

A. Civil Defense Act of 1950

- Sec. 2281(d) - develop protective measures for essential equipment and facilities

B. Energy Security Act of 1980

- Sec 302 - grants the President authority to make provisions to fund essential contractors in expedient production and delivery concerning essential facilities and energy resources

C. Federal Energy Administration Act of 1974 - develop plans and procedures to protect essential energy resources to meet the energy needs of the Nation.

D. EO 11490 - Assignment of Emergency Preparedness Functions to federal departments and agencies

- Sec. 701 - directs the Secretary of Energy to perform the following preparedness and planning:
  - To coordinate with other appropriate departments and agencies to perform emergency assessment and preparedness programs, and to provide technical advice and assistance within the scope of DOE activities
  - To develop with industry necessary plans, programs, and procedures for emergency preparedness of petroleum assets
  - To render advice on radiation and damage probabilities in the event of disasters

- Sec. 2901 - directs the Office of Personnel Management to develop, organize, and conduct interagency training programs in emergency personnel management

- Sec. 1101 - assigns the Attorney General or his authorized representatives the responsibilities to provide consultation in approving voluntary agreements between government and industry during emergencies

- Sec. 2202 - assigns the Federal Emergency Management Agency responsibilities for coordination of all emergency preparedness activities of the federal government

VII. SUPPORTING MATERIAL

A. Industry views on feasibility of EMP mitigation at petroleum facilities

- Petroleum industry is having severe financial difficulties at present
  - Expenditures need to be revenue-related
  - Probably less receptive to a government program than during better market
  - Unlikely to be willing to spend money unless in imminent danger
- Industry unaware of industry-specific dangers of EMP
  - Issue has not been addressed by associations or by DOE
  - Actual degree of vulnerability unknown
  - Uncertainty of procedures and costs make industry assume that EMP mitigation procedures would be costly and cumbersome; thus, the immediate response is negative
- Degree of electronics in facilities varies greatly
  - Older facilities use pneumatic controls
    - -- At least one large refinery is still pneumatically controlled
    - -- Many facilities have partial conversions but the extent that these could revert totally to pneumatic or analog controls is unknown
  - Wellheads probably could function without electronics
  - Some wellheads flow naturally due to pull of gravity
  - With a great deal of manpower, some pumping stations could be manually operated; others have no backup capability
  - Many facilities do not have backup power necessary to continue operating
  - The size and function of facilities varies enormously industry-wide
    - -- Some small refineries specialize in certain distillates
    - -- Other refineries include entire process
  - Most facilities have "fail safe" modes to safely shut down operations when electronics fail

- EMP mitigation aimed only at production of diesel, kerosene, and home heating fuel is probably not feasible since these are highly refined distillates

- Without reconfiguration of facilities, it would be difficult to aim EMP mitigation at first order distillates because there is so much coupling throughout facilities

B. Industry views on alternative actions

- General

  - Industry afraid of regulated solutions
  - Industry funding unlikely
  - Consideration should be given to working with control system manufacturers rather than petroleum corporations
  - API seminars would be the appropriate forum for discussion and consideration of EMP mitigation by the petroleum industry, although currently there is no security committee
  - DOE should approach individual companies through top management
  - Understanding of issues too general for in-depth opinions on the comparative merits of the options

- Option A: Government request selected petroleum companies to implement peacetime EMP mitigation procedures to develop plans for implementation of crisis EMP mitigation procedures at selected facilities.

  - If relatively inexpensive, this is the option which is more likely to be given consideration

- Option B: Government requests selected petroleum companies to EMP harden external power and communication lines at selected facilities.

  - Value questioned since internal facilities would not be hardened

- Option C: Government requests selected petroleum companies to EMP harden selected facilities.

  - Assumed to be too disruptive and too expensive

- Option D: Government requests all petroleum companies to EMP harden all facilities.

  - Assumed to be too disruptive and too expensive
  - Value questioned since some facilities will be less vulnerable and therefore may not need to be EMP hardened

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D. Organizations and Persons Contacted

COMPANIES/AGENCIES	INDIVIDUALS
American Petroleum Institute	Bruce Peterson, Michael Hildebrandt, Dudley Orr, Ron Jones
Amoco	Robert Wade
Department of Energy	James Busse, Les Byers, Kenneth Klein
Federal Emergency Management Agency	Russell Gates
Honeywell	Ron Bywaters
IRT Corporation	John Labadie
Shell Oil	Jerry Goll, Fred Politz

ENHANCING THE POTENTIAL

FOR POSTATTACK RECOVERY

INDUSTRY INVOLVEMENT IN THE RESEARCH AND PUBLICATION

OF SURVIVAL INFORMATION

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INDUSTRY INVOLVEMENT IN THE RESEARCH AND PUBLICATION OF SURVIVAL INFORMATION

I. INTRODUCTION

The purpose of this paper is to explore how the federal government could enlist industry and industrial associations to cooperate in funding and performing research, publication, and dissemination of survival information.

The reasons for such an effort are twofold:

(1) In the event of nuclear attack, the surviving population and industries will need to be knowledgeable in survival methods.

(2) Due to current budget constraints, the federal government has limited funding for such a program.

This paper centers on how the government can best solicit industry cooperation and financial support to achieve the desired results. Government will need a cohesive and direct plan for a program which can be communicated to industry so that complimentary efforts will be undertaken by different corporations.

II. APPROACH

A. General

Since the representatives of the industrial sector are the ultimate experts in their fields, their cooperation with government is vital to the planning of recovery from emergency situations. Government should approach industry and solicit cooperation in programs which can equip the nation to recover from large disasters.

1. National Program

Initiation will need to come from the government in the planning of a cohesive national program which will clearly define the desired industrial sector role.

Government must clearly define and communicate a program to include:

- Topics to be researched and published
- Critical industries to be approached
- A plan to approach and motivate industry leaders

- Means to administer the program
- Sources of funding for the program
- Plan to disseminate information

The government should implement a national program which will solicit the cooperation of the industrial sector. The program should be approached as a three phase effort:

Phase I - Program Planning
Phase II - Program Implementation
Phase III - Program Follow-Up

2. Expected Levels of Industrial Participation

Based on the government program to appeal to industry, participation can be expected on one of three levels:

(a) Voluntarily - Representatives of industry agree to cooperate because they desire to participate. The participation should be solicited via a direct patriotic appeal to the leaders of industry.

(b) With incentives - Representatives of industry agree to cooperate based on incentives granted by the government. Government incentives can include:

- Government recognition awards - Presidential letters, citations, placques, etc.
- Government assistance in the creation of a new non-profit corporation which would manage overall effort and be the recipient of donations
- IRS recognition of expenses as an allowable business deduction
- New tax credit similar to energy credit program
- Government works with the insurance industry to reduce insurance premiums for cooperating corporations
- Recognition through advocacy advertising - details described later in this paper
- Indemnification against tort liability claims

(c) As mandated - The government can make cooperation a mandatory pre-condition for the awarding of government contracts, grants, and loans. In other words, certain government contracts, grants, and loan guarantees would include a clause which would make cooperation a requirement during the performance of that instrument.

B. Phase I - Program Planning

During Phase I, the government will need to organize an ad hoc panel to be responsible for the program. The plan should include appropriate government agencies, as well as industry representatives. The panel will plan all aspects of the program and then insure that the program is implemented as planned.

The panel will:

- Develop a national plan and define the desired program results. This includes a methodology for achieving those desired results.

- Develop a list of topic areas for research and publication. Table 1 contains a list of candidate areas for study.

- Plan for all aspects of administering the program including:

  - Allowing the diverse groups which comprise the industrial sector to participate in planning
  - Providing a system for conflict resolution and to avoid duplication

- Develop a set of critical industries to be approached. Corporations within industries must be selected based on their experience and the priorities of the program. Industrial associations and special interest groups may be approached in order to solicit aid from many representatives of an industrial sector. Selected industry sectors may include:

  - Medical suppliers
  - Transportation
  - Food producers/processors
  - Fuel producers
  - Camping/hunting/survival specialists

- Plan for the funding of the government portion of the program. Determine the size and scope of the work to be performed by the government during the three phases and associated costs.

SUBJECT	DEPARTMENT OR AGENCY	CORPORATION	ASSOCIATIONS & ORGANIZATIONS
AGRICULTURE • NBC Effects On Soil, Seeds, Crops, Livestock • Alternative Methods - Breeding & Slaughtering - Cultivating Crops - Fertilizer & Pesticide Production Or Use - Food Preservation & Storage • Alternative Food Sources • Basic Techniques For - Irrigation - Raising & Harvesting Fish - Food Preservation & Storage - Articifial Insemination of Livestock - Use Of Seed Stocks	Department Of Agriculture Soil Conservation Service Federal Emergency Management Agency Food & Drug Administration	Wayne Feeds Southern States International Harvestor John Deere Massey Ferguson Tordon David Brown Allis Chalmers Ford Case Mason, Kerr Sire Funk's	American Farm Bureau Federation American Dairy Association R&D Associates For Military Food & Packaging Systems Fertilizer Institute Irrigation Association National Fertilizer Organization Pesticides Producers Association Soil Conservation Society Of America National Cattlemans Association Future Farmers Of America National Farmers Organization Animal Health Institute Wildlife Disease Association Food & Energy Council American Fish Farmers Federation National Agricultural Chemical Association
ENERGY • Conserving Fuel & Electricity • Alternative Sources Of Fuel & Electric Power • Fuel Distribution & Handling Methods	Department Of Energy Department Of Transportation Tennessee Valley Authority Federal Emergency Management Agency	Exxon Shell Mobil Texaco Appalachin Power Virginia Power Phillips Tennaco	Energy Consumers & Producers Association Geothermal Resources Council American Petroleum Institute National Petroleum Council Electric Power Research Institute Edison Electric Institute
HEALTH • Self-Help Medical Care • Potential Epidemics • Blood Typing • Sanitation & Decontamination Methods • Radiation Effects & Testing	Public Health Servce Drug Enforcement Administration Department Of Defense Federal Emergency Management Agency	Washington Hospital Center 1st Colony Squibb Upjohn Miles Johnson & Johnson Proctor & Gamble Smith, Kline & French Drug Fair	American Trauma Society International Health Society National Health Council American Medical Association American Blood Resources Association Red Cross Health Industries Manufacturers Institute Pharmaceutical Manufacturers Association American Hospital Association
HOUSING • Habitable Guidelines • Assignment Guidelines • Fallout Protection	Department Of Housing & Urban Development Army Corps Of Engineers Department Of Agriculture	Ryland Century 21 East-Atlantic Company Northern County Homes	National Association Of Home Builders Of the United States National Housing Council National Manufactured Housing Finance Association United Way American Association Of Housing Educators American Society of Civil Engineers

TABLE 1

CANDIDATES FOR RESEARCH AND PUBLICATION

SUBJECT	DEPARTMENT OR AGENCY	CORPORATION	ASSOCIATIONS & ORGANIZATIONS
POTABLE WATER • Radiation & Quality Testing • Purifying & Decontamination Methods • Extraction Methods • Rationing & Conservation Methods • Locating Sources	Environmental Protection Agency Department Of Defense Army Corps Of Engineers Tennessee Valley Authority Department Of Agriculture Federal Emergency Management Agency	Snow Valley Water Company Pure Mountain Water Dist. Blue Rock Mountain Spring Water Clean Water Fund Clean Water Action Project Berkeley Springs Minerals	American Water Works Association Federal Water Quality Association National Water Resources Association Water Systems Council National Association Of Water Companies Alternative Waste Water Management Association
TRANSPORTATION • Alternatives To Conventional Methods • Emergency Deployment	Department Of Transportation Federal Highway Administration Federal Emergency Management Agency	Tennaco Amtrak General Motors Ford Boeing Airschott	Institute For Safety In Transportation National Defense Transportation Association Transportation Research Board Transportation Association Of America Institution Of Transportation Engineers
INDUSTRIAL • Crisis Dispersal • EMP Protection • Facility Protection	Department Of Defense Department Of Transportation Federal Emergency Management Agency	Exxon Shell Mobil Squibb Smith, Kline & French IBM Xerox Honeywell	Pharmaceutical Manufacturers Association American Petroleum Institute The American Civil Defense Association

TABLE 1
(cont.)

CANDIDATES FOR RESEARCH AND PUBLICATION

- Plan for publication and dissemination of the program findings. This may include methods to communicate information to industries and the general public.

C. Phase II - Program Implementation

Based on the plans developed in Phase I, the government will implement and administer the program. Initially, the panel will approach and solicit the help of industry and its related associations.

To achieve the cooperation of industry, the government can include one or more of the following approaches:

- Personal appeals to the leaders of critical industries
- Appeals to industrial associations and special interest groups to provide support from segments of critical industries
- Government public relations (PR) campaign
  - Remind industry of the significant effect of government on business
  - Use of advocacy advertising

The government should be mindful that the business community is operating in a very complex environment where it must interact with labor, investors, business associations, special interest groups, vendors, the community, the public, customers, scientists, shareholders, as well as the government.

1. Personal Appeals to the Leaders of Industry

The panel will have to appeal to the leaders of the critical industries on a personal basis. Industries and corporations are led by individuals who each have their own views on the required degree of social responsibility.

The panel must determine who the leaders are, and seek their cooperation directly by appealing to them to exercise their social responsibility. This program could also appeal to the leaders of industry based on the value of the industrial preparedness aspects as it pertains to their individual companies. The presentation of a clearly defined program with clear goals should appeal to the leaders of industry. The government should present a formal kick-off of the program, in conjunction with an appeal from the President, which would call for cooperation and participation in the program.

2. Appeals to Industrial Associations and Special Interest Groups

The industrial sector of our economy operates within a complex environment. Industries rely on industrial or trade associations and special interest groups, as these groups can provide collective expertise in their fields. The government can task an association for survival related research and thereby draw from the expertise of a multi-corporate group.

The practice of lobbying by special interest groups or trade associations gives corporations an opportunity to be major participants in the political process. This relationship need not be a one-way channel. Government can "lobby the lobbies" to ask for cooperation in the area of emergency preparedness.

The government should approach associations and special interest groups in the same way it approaches the industries - through personal appeal to the leaders of the organizations.

3. Government PR Campaign

The government should produce a PR campaign in order to publicize the program and help persuade industry and the public to internalize the national goals. The PR campaign will:

- Provide an indirect means of announcing the goals and necessity of the program to members of industry and the public.
- Present the concept of post-disaster preparedness and recovery to the American public and educate the public on personal survival skills.
- Persuade the leaders of industry that they play a large part in emergency preparedness.
- Provide an opportunity for corporations to present themselves as patriotic which may be used in their own PR programs.

The government can achieve its desired PR goals through:

- Reminding the industries of the positive aspects of government relations
- Use of advocacy advertising

(a) Appeal to Industry

The following are a few of the significant effects of government on business which could be emphasized when appealing to industry for cooperation. The government:

- Promotes businesses through direct subsidies to certain industries or sectors of the economy
- Establishes tariffs or other import restrictions to protect domestic industry from foreign competition
- Provides favorable tax incentives that promote industries, such as mortgage interest deductions for homeowners, to promote the housing industry
- Finances independent research and development in certain sectors, such as defense contractors
- Assists companies which are failing by providing loan guarantees which aid the financial institutions in granting credit, i.e. Chrysler and Lockheed
- Functions as a consumer of goods and services and supports many corporations who rely solely on government contracts
- Provides social regulation to promote social values that improve the quality of life

(b) Advocacy Advertising

Advocacy advertising is the segment of advertising which deals with corporate image and the presentation of a particular position or interest. It has also been called "issue-oriented advertising." According to Sethi, "The behaviorial and social context of advocacy advertising is that of changing public perception of a corporation's actions and performance from skepticism and hostility to trust and acceptance."[1] The same concept can be used by the government to convince the American public and the critical sectors in industry that emergency preparedness and recovery are crucial national goals.

This concept of advertising is not new to the government. In the past, the government has used this form of advertising in:

- World War II "buy bonds" campaigns

[1]S. Prakash Sethi, Advocacy Advertising and Large Corporations, 1977. p.7.

- Publicizing social issues
  - Environmental protection
  - Litter reduction
  - Prevent forest fires
  - Just say no to drugs
- Presenting public service announcements
  - e.g., "write to Pueblo, Colorado, for consumer information"

Table 2 presents the types of advocacy advertising which are appropriate for government use.

Advocacy advertising can be used to:

- Persuade industries to cooperate with the government
- Present the program on a national level to both industry and the American public
- Sell the program to the general public
- Reward participating corporations through recognition of their contributions
- Persuade industry representatives to disseminate the findings of the program to other members of industry and the public

D. Phase III - Program Follow-Up

After the program has been actively implemented, a government evaluation phase must begin. The government should:

- Collect and review industry materials - The results of industry or association research and development programs must be collected and reviewed.
- Publication and dissemination of research materials - The information gathered must be submitted for publication and released for dissemination to industry and the public. Government could persuade industry to perform these functions.
- Determining rewards to industries who provide outstanding research.
- Determining sanctions for corporations who accept incentives and do not provide participation in return.

TABLE 2

TYPES OF ADVOCACY ADVERTISING

	TYPE	THEMES OF ADVERTISING COPY
1.	DISINTERESTED SPONSOR - No direct immediate benefits for the sponsor are envisaged.	General issues of public interest or with an ideological or philosophical context are presented, e.g., present survival as necessary to promote the common good of the country.
2.	BENEVOLENT SUPPORT - Sponsor's interests are presented as indirectly related.	Issues of interest to sponsor are presented within the framework of overall social problem. Public is exhorted to make sacrifices voluntarily. This type of advertising should be the main focus of the government PR program. The government can present any of the areas to be researched and solicit support from industry and the public. Can also be used to disseminate the findings of the research program.
3.	SELF-RIGHTEOUS SPONSOR - Sponsor's identity and selfish interest are directly associated with the advocated programs.	Open defense of self-interest, downgrading of opponents and their arguments. General public interests are only indirectly presented; e.g., the penalty to be paid if you are not prepared for survival.
4.	PARTICIPATIVE SUPPORT - Sponsor's interest is carefully disguised.	Issues are presented as problems common to industry and also in the public interest; e.g., present survival in a "united we stand" context.
5.	ELUSIVE SPONSOR - Sponsor's identity and interest carefully disguised to convey an image of conscious disinterest.	Issues are tailored to public benefit and general social concern without any mention of sponsor's interest. Present survival as a public and industrial concern with no emphasis on government concern.

Source: Advocacy Advertising and Large Corporations by S. Prakash Sethi

III. EXPECTED ADVANTAGES, DISADVANTAGES, AND COSTS

A. Advantages

The advantages of administering a national program to solicit the cooperation of industry are as follows:

- The experts in their respective fields are used to present their ideas and perform research
- The costs of research are funded by industry, thereby reducing the costs to the government
- The state of the art in emergency preparedness and survival methods can be determined and areas deemed deficient improved
- Vital information can be collected and disseminated to government, industries, and the general public
- Information which has been previously gathered by different government agencies can be pulled together
- Industry and government relations will be improved
  - Promotes PR opportunities for both government and industry
  - FEMA develops awareness, interest, and demand for other emergency preparedness services and programs available for industry and the public
  - Enables industry to be viewed as highly patriotic
  - Industry fulfills social responsibility
- Industry participation increases regional benefits
  - Geographic requirements are satisfied with a tailored program
  - Industry's own relevant interests are met, since survival methods for the following could be covered:
    - -- Earthquakes
    - -- Tornadoes
    - -- Floods
    - -- Snowstorms
    - -- Nuclear accidents
    - -- Nuclear attack
- The survivability of all entities, public and industrial, will be increased due to:
  - Reduction in the likelihood of chaos during emergency or disaster situations
  - Making industry, as well as the general public, more aware of the effects of nuclear attack

-- Blast
-- Fallout
-- Electromagnetic pulse
- Survival skills
- Enhancing industry's knowledge of how to increase production possibilities in the postattack period

B. Disadvantages

The disadvantages of administering a national program to solicit the cooperation of industry are as follows:

- Even with a carefully defined and implemented program, the desired cooperation may not be achieved
  - Program may be too costly for corporation participation
  - Industry may be reticient to participate since post disaster recovery is a touchy subject with the American public; the American public does not want to think in terms of post nuclear attack; therefore, the program may have to be aligned with arms limitations or peace negotiation programs
  - Business leaders may not participate, as they may perceive emergency preparedness as a public issue not one for which their corporation is individually responsible
  - Business leaders may not participate because they may believe that government regulations hamper their effectiveness and act as a damper on their ability to make a profit
- Could create public apprehension
- Program may require constant maintenance to ensure that survival information has not become dated due to rapid growth of technology

C. Costs

Phase I - Program Planning

- The following financial costs would need to be assumed by the government:
  - Personnel for planning
  - Consultants
  - Travel
  - PR materials
  - Meetings expenses

- The following financial costs would need to be assumed by industry:

  - Personnel for planning
  - Travel

Phase II: Program Implementation

- The following financial costs would need to be assumed by the government:

  - Program administration
  - Public relations

- The following financial costs would need to be assumed by industry:

  - Program administration
  - Personnel
  - Research
  - Publication

Phase III: Program Follow-Up

- The following financial costs would need to be assumed by the government:

  - Program evaluation
  - Program administration
  - Dissemination

- The following financial costs would need to be assumed by industry:

  - Program administration
  - Production
  - Publication
  - Dissemination

IV. SUPPORTING MATERIAL

A. Industry Views

During the course of this project, industry representatives have been interviewed regarding various topics. During these interviews, the question was raised as to: (1) industries' willingness to fund and perform research and publication of survival related materials, and (2) how government should approach industry on this matter. The responses to this question can be summarized as follows:

- Most companies and associations were not averse to the idea of participating in such an effort
- Some associations whose members are individuals rather than corporations, expressed a willingness to find association members to perform research and write pamphlets
- Some associations would be willing to actually develop manuals and pamphlets
- Associations would also be willing to disseminate survival information provided by the government
- Some companies recommended that, in order to get such an effort started, the larger corporations who sell directly to consumers would need to be approached first (example: Johnson and Johnson for pharmaceuticals)
- Some representatives felt that participating in such an effort could be good for their public relations image
- Some companies would agree to fund such an effort, but were not interested in participating in the actual research and publication
- Company representatives recommended that, to get such an effort started, corporate top management would need to be approached for participation
- Companies showed interest in participating in such an effort if government would provide technical assistance or some sort of economic benefit

B. Corporate Motivational Psychology

Corporate motivational psychology was researched as background information for this paper. The rationale behind the types of responses are provided here as supplemental material. They should be taken into consideration when planning how to approach industrial leaders during Phase II of the program.

Motivational theories of industrial participation have been divided into four responsiveness types by Buono and Nichols[2] as follows:

1. Productivism

...business exists in order to fulfill a specialized technical role in society, namely to produce wealth. The task is critically important for any society, and it is therefore "proper" that people in business should take pride in discharging their mission. When businesses observe safe and sound practices, and maximize profits while minimizing losses, they are serving the common good and behaving in a responsible manner.

2. Philanthropy

...the obligations that corporations have to society go beyond considerations of profit and loss....The philanthropic interpretation of corporate social responsibility thus constitutes a critique of libertarian capitalism - though a mild one - and offers a version of corporate life in which private prosperity is combined with an explicit, through limited, emphasis on moral development.

3. Progressivism

...progressivism builds upon the premise that enlightened self-interest requires business to accept a limited role as an agent of social change, as a part of a process of permanent reform. Responsibility means the gradual incorporation of selected new social values and priorities into corporate operations, and their expression in activities necessary to sustain public confidence, even when these are based on non-market principles. Specific progressivist policies include aggressive voluntary programs of affirmative action for women and ethnic minorities, as well as investments in urban revitalization or minority-owned firms, energy conservation, environmental protection, and efforts to hire the hard-core unemployable.

[2]Buono and Nichols, Corporate Policy, Values and Social Responsibility, p.74

4. Ethical Idealism

...ethical idealism rests upon the premise that responsiveness requires a complete reassessment of the place of business in society. Putting this in slightly different terms, we may say that the ethical idealist perspective constitutes a radical critique of business theory and practice. Such criticism is produced by means of a comparison of the assumptions of current practice and some set of ethical ideals, adopted as the criterion of what is desirable and necessary.

C. Social Responsibility

One reason for industry to cooperate with the government in researching survival issues is a chance to fulfill their sense of social responsibility. Therefore, Davis and Blomstrom's[3] definition of social responsibility has been included as follows:

...the idea of social responsibility implies that prior to a decision a person will consider the widest possible effects of his decision on the public interest. Social responsibility, therefore, refers to a person's obligation to evaluate in the decision-making process the effects of both his personal and institutional decisions and actions on the whole social system. The substance of social responsibility arises from concern for the ethical consequences of one's acts as they might affect the interests of others.

D. Authorities

Civil Defense Act of 1950

- Sec. 201(f) - Authorizes officials to publicly disseminate appropriate civil defense information by all appropriate means
- Sec. 502(12) - calls for the improvement of emergency public information, training programs, and capabilities

[3]Davis and Blomstrom, Business, Society, and Environment: Social Power and Social Response, 1971. p. 85

United States Code 50

- 2281(d) - allows for civil defense programs to include research and study of the best methods of treating effects of attacks on shelters and equipment
- 2302(b)(14) - creates the improvement of and training in self-help nuclear war survival skills
- 2302(b)(15) - allows for civil defense-related research and development
- 2302(b)(16) - expands the development of other appropriate systems and capabilities to increase the lifesaving potential of the civil defense program

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- 303 - authorizes FEMA to withhold payments of financial contributions to states or persons or may limit such payments to specified programs or projects due to failure to follow regulations, terms, and conditions established in the Civil Defense Act of 1950
- 360 - states the Emergency Management Training Program as an on-going inter-governmental endeavor which combines financial and human resources to fulfill the unique training needs of local government, state emergency staffs, state agencies, as well as the general public

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F. Organizations and Persons Contacted

COMPANIES/AGENCIES	INDIVIDUALS
American Civil Defense Association	Walter Murphy
American Petroleum Institute	Bruce Peterson
American Pharmaceutical Association	Maude Babington
Food and Drug Administration	Anastasia Perez
National Association of Broadcasters	Ralph Justice
National Wholesale Drug Association	Charles Meyers
Pfizer	Paul Pendorf
Smith, Klein and French, Inc.	Edmund Pyle George Martin
Washington Wholesale Drugs	David Weiner

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